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WATER COOPERATION

VIEWS ON PROGRESS AND THE WAY FORWARD

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Summary for Decision Makers

Cooperation on water is central to development. In addition to being a catalyst for peace and security, water cooperation is vitally important for development at all levels.

Significant achievements have been made through cooperation, yet much more remains to be done.

Despite the potential for conflict, common needs for shared waters allow countries to come together in search of shared benefits from managing resources. More than 200 water treaties have been negotiated over the last 50 years. As more pressure builds on the world's water resources, previous experience in cooperating towards water sustainability serves as useful guidance for future agreements.

Mechanisms for sustainable financial management are critical to the success of water cooperation. There is a need for clear legal, organizational, financial, and economic mechanisms in order to solve water, energy, environmental, and other issues at the national and regional levels. Sustainable use of water resources has to be linked to economic regulation (tariffs, penalties, and administrative and criminal enforcement) and organizational structure (unification of water users, consideration for environmental and economic conditions, metering water use, and consideration of the market conditions). Inadequate tariff systems and deficient systems of charging for water supply services prevent the irrigation and water supply systems from being properly maintained.

Targeted national development policies are essential to improve the level of cooperation observed within countries. It is encouraging that in the recent years many countries have started paying more attention to an integrated approach towards management of water together with other key sectors of the national economy. However, in many cases the national plans of integrated water resources management (IWRM) have not been coordinated either at the transboundary level or with relevant regional strategies. For this reason, many IWRM plans have not reached their full potential or effectiveness.

It is of paramount importance that basin organizations and water user associations continue operating effectively. Widespread establishment of basin organizations, water user associations (WUAs), water users federations, and other similar groups has required a strengthening of their capacity to offer comprehensive solutions to local problems. These approaches are also effective in obtaining high yields of agricultural crops, as well as maintaining farm assets. Accordingly, it can be argued that efforts to support these mechanisms must continue.

The United Nations system must act as the primary enabler of water cooperation. With a direct and express mandate to build the capacity of its member states, the United Nations system collectively has to shoulder the burden of successful water cooperation — even when this responsibility is shared with other development partners. Despite some major challenges in the effective delivery of assistance and solutions to member states, the UN

system remains the only international mechanism that has presence on the ground in all developing countries and has the appropriate linkages to national governments.

Overseas Development Aid (ODA) and Foreign Direct Investments (FDI) remain a central pillar of successful water cooperation. Financial support for cooperation by the donor community is important; for example, without such support, creation of water users associations might be impossible. However, in the long term, the key is that communities must understand the need for cooperation and the need for mutual support.

Lack of human, technological, infrastructural, and institutional capacity is the foremost impediment to effective water cooperation. Yet, we do not have reliable estimates of the global capacities needed to meet various development objectives, including those now being enshrined in the post-2015 Sustainable Development Goals (SDGs). It is obviously a priority to get a better estimate of capacity needs across the board.

Multi-dimensional capacity development is critical. Capacity development must account for multiple dimensions in parallel (human, technological, institutional, and service provisioning), and do so in an integrated manner. Problems are persistently encountered in capacity development initiatives — namely only one aspect of a multidimensional capacity gap is addressed, leading to less satisfactory outcomes, or often near-complete failure to build long-term capacity.

Availability of information and reporting by governments on water cooperation remains patchy and sparse. The specific lens of water cooperation has not been adequately incorporated into the data/information gathering part of the evaluation of water cooperation. It is equally difficult to determine whether water cooperation has taken place and if progress is being made by the governments to rectify barriers to such cooperation. While the mere occurrence of IWRM can be considered as a sign of water cooperation taking place, observed at a point in time, it is not conducive to be used as a long-term indicator of success.

International partners must consolidate monitoring of progress along the SDG implementation trajectory. The development of a multi-agency initiative entitled Global Extended Monitoring Initiative, or GEMI, is already underway with the primary purpose of monitoring Targets 6.3 through 6.6 of SDG Goal 6. A number of partners from the UN system — namely WHO, UN-Habitat, UNEP, and FAO — are collaborating under UN-Water coordination to establish a global monitoring system. Such a system addressing data collection, harmonization, quality control, and country-level profiles on the one hand, and the needs of capacity and other technical support, on the other hand, can serve to support and strengthen water cooperation.



Progress on Water Cooperation¹

THE NEED FOR COOPERATION

Freshwater bodies that connect two or more countries, either above or below surface, cover about 45% of the world's land mass. There are 276 international river basins, of which 60% do not have any framework in place to manage these shared resources cooperatively. This could be cause for concern, as water resource issues have heightened tensions throughout history. Collectively, there have been 37 incidents of conflict over water since 1948.

Besides being a catalyst for peace and security, water cooperation is important for development. About 70% of the world's freshwater that is withdrawn goes to agriculture. Of the water withdrawn for industrial activity, about 80% is for energy generation. As countries grow economically, this nexus between water, food, and energy places more stress on water resources. World population growth is expected to occur most heavily in areas that rely largely on other regions for food production. The result is inter-regional dependency in which countries to have share either virtual or real water.

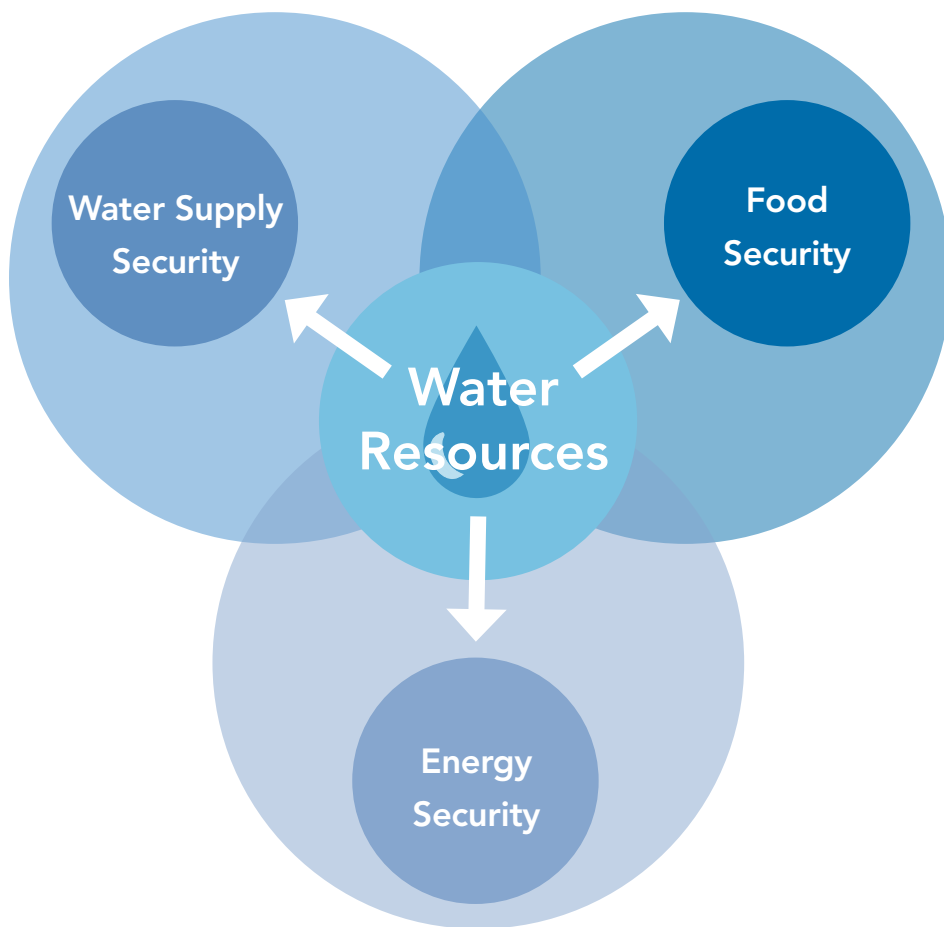
While economic and population growth demand more water, climate change has placed enormous strain on supplies of freshwater in many parts of the world. An interesting example is the glaciers in the Himalayas

feed rivers that provide drinking water to over half of the world's population. Warming has accelerated glacial melt, and projections for glacial decline expect these rivers to become more seasonal. Increased flooding followed by a seasonal lack of freshwater will implicate countries across borders and make cooperation vital to maintain water resource levels. In other places in the world, variability in the frequency of rainfall and changes in mean temperatures will pose challenges.

Despite the potential for conflict, common needs for shared waters allow countries to come together in search of shared benefits from managing resources. More than 200 water treaties have been negotiated over the last 50 years. As more pressure builds on the world's water resources, previous experience cooperating towards water sustainability serves as useful guidance for future agreements.

¹ Sections of this chapter have been drafted with the support of Jacob Deutmeyer and Julia Purdy, Interns of the United Nations Office to support the International Decade for Action 'Water for Life' 2005-2015 (UNW-DPAC, 2013 a, UNW-DPAC, 2013 e).

FIGURE 1: WATER RESOURCES AT THE NEXUS OF WATER SUPPLY SECURITY, FOOD SECURITY, AND ENERGY SECURITY



EVOLUTION OF WATER COOPERATION

Cooperation on transboundary water resources has evolved ever since international water law took its strongest roots after World War II. Important negotiations in the 1950s and 1960s, such as agreements made on the Mekong, Indus, and Senegal rivers, helped gain experience and lessons were learned on how to make cooperation successful. While some of these were bilateral agreements, parties like the Tennessee Valley Authority, the World Bank, and United Nations were called upon to bring expertise and help in reaching a deal.

Since then, more international framework and knowledge sharing has taken place, and negotiations have moved more from being bilateral to multilateral. 1992 marked a crucial point in the increased raise of awareness for water cooperation in the world when the UNECE Water Convention was adopted. Five years later, the UN General Assembly adopted the Convention on the Law of the Non-Navigational Uses of International Watercourses. Both conventions complement each other as global frameworks based on principles of cooperation, no harm, and equitable usage of water resources. However, the UNECE Water Convention uses mandatory principles and supports them with its own institutional mechanism.

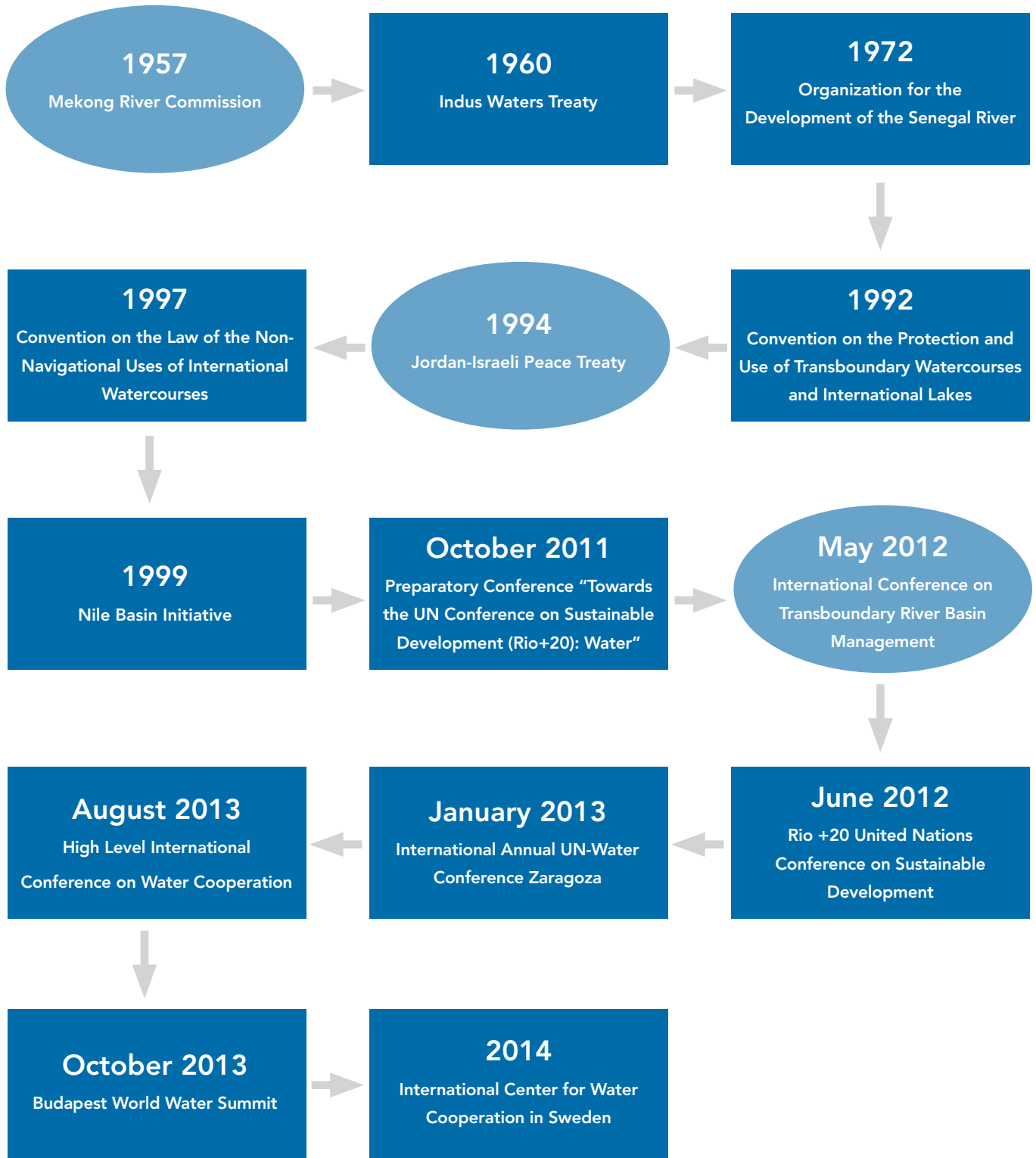
Institutionalization of river basin development has been seen throughout the evolution of cooperation on water, and several studies have been done about the formation of “water regimes.” Alexander Wendt, who has written about social theory of international politics, wrote, “this process of institutionalization is one in which actors internalize new understandings of self and other and, furthermore, move towards increasingly shared commitments to the norms of the regime.” Agreements in Africa often form such institutions to develop areas cooperatively, such as the 1999 Nile Basin Initiative and 2002 Senegal River Charter. In the latter, a 4-Year Water and Environmental Management Project was funded by GEF, which has played an important role in funding other projects within the framework of the Water Convention.

In February 2011, the push for water cooperation advocacy gained huge momentum. The UN General Assembly decided to proclaim 2013 as the International Year of Water Cooperation (IYWC) to promote action at all levels and achieve water related development goals through cooperation. Tajikistan, which has been a key initiator for action on water cooperation, held a Preparatory Conference in 2011 that developed recommendations for the Rio+20 Summit in June 2012, where a thematic session specifically for Water Cooperation was held. The 2012 International Conference on Transboundary River Basin Management in Thailand also showed the shift to action on knowledge as the event marked the first of a series of biennial conferences for the Mekong River Commission.

The 2013 IYWC’s first event was the International Annual UN-Water Conference in Zaragoza. It built upon previous progress made in water cooperation with case studies, dialogue, and presentations around global experiences with water treaties or conventions. Tajikistan hosted the High Level International Conference on Water Cooperation in August 2013 (Dushanbe). This event in many ways was a tipping point for progress. Dialogue with the Open Working Group began and has continued since then, keeping water cooperation in mind for the post-2015 Sustainable Development Goals. Throughout the year, synergies with other initiatives helped give the UN a stronger voice for joint advocacy.

In 2014, despite the IYWC having passed, there were several events that kept water cooperation at the forefront of topics. As a way to build capacity on the subject, UNESCO reached an agreement with Sweden to open an International Center for Water Cooperation. The center will undertake independent research regarding transboundary water issues and provide advisory services.

FIGURE 2: EVOLUTION OF WATER COOPERATION TIMELINE



A BRIEF HISTORY OF UN WATER CONVENTIONS

The significance of water cooperation was growing in the world's awareness well before 2005, when the International Decade for Action 'Water for Life' (2005 – 2015) began. Two intergovernmental conventions have further grown and developed, and have been key during the international water decade.

The first intergovernmental convention to be discussed, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, was adopted in 1992 by the UNECE (United Nations Economic Commission for Europe). This convention serves to strengthen transboundary water cooperation and measure environmental management and protection of transboundary waters. The convention requires countries to prevent, control, and reduce transboundary impact, use transboundary waters in a reasonable and equitable way, and ensure their sustainable management through specific agreements and establishment of joint bodies. Three interesting principles serve as the core of this convention. One: *The Precautionary Principle*, which serves to avoid the potential transboundary impact of the release of hazardous substances that shall not be postponed on the ground that scientific research has not fully proved a causal link between those substances, on the one hand, and the potential transboundary impact, on the other hand. Two: *The Polluter-Payers Principle* states that the costs of pollution prevention, control, and reduction measures shall be borne by the polluter. Three: *The Posterity Principle*, which states that water resources shall be managed so that the needs of the present generation are met without compromising the ability of future generations to meet their own needs.

This UNECE Convention completes 23 years of successful water cooperation in 2015. Rooted in its three principles, this convention provides a legal framework and an intergovernmental platform for the promotion of cooperation and sustainable management of water resources in the Pan-European region. Its implementation has facilitated the adoption of better policies for the

management of water resources, resulting in an overall improvement of their status. Almost all the countries of this region have taken measures to establish cooperation on their shared waters; they have entered into bilateral and multilateral agreements and established joint bodies for transboundary water cooperation.

Further, the Convention on the Protection and Use of Transboundary Watercourses and International Lakes was amended in 2003, opening it for accession by any Member State of the United Nations. As of 6 February 2013, this convention can be implemented beyond Europe, and since 2009, over 22 non-UNECE States have participated. In fact, 18 non-UNECE States took part in the sixth Meeting of the Parties in Rome, 28-30 November 2012. In future, more states are likely to join such as Iraq and Tunisia, each of which has expressed a strong interest.

The second convention, the Convention on the Law of the Non-Navigational Uses of International Watercourses, was adopted in 1997. It is commonly referred to as the "UN Watercourses Convention". The aim of this convention is to create an equitable and reasonable treaty with universal applicability; a framework convention that is flexible to apply to different international watercourses. It establishes agreed upon principles to use for dispute resolution and seeks to prevent harm to other states sharing the watercourse. It was opened for signature from 1997 to 2000. After a long gestation period during which a number of countries became signatories and ratified the convention, it entered into force in August 2014 when the 35th member state ratified it. There are three more member states that have signed but not ratified the convention yet.

HOTSPOTS

Africa:

Africa has 63 river basins, of which 20 have international agreements in effect and 16 with institutionalized transboundary forums. Progress has been made over time, with areas in South Africa having more equitable rights established than when apartheid policies were in place. Many continental, regional, and national organizations have been developed to focus on cooperation, like the Southern African Development Community (SADC), Niger Basin Authority (NBA), Lake Chad Basin Commission (LCBC), Lake Victoria Basin Commission (LVBC), Lake Victoria Fisheries Organization (LVFO), Lake Tanganyika Authority (LTA), and the African Ministers' Council on Water (AMCOW). SADC created a Protocol on Shared Watercourse Systems in 1995 that later was revised and adopted to be in line with the 1997 UN Watercourses Convention.

International finance and donors have played a significant role in founding most of these organizations; some international actors include the G8 Africa Action Plan, Africa's Development Action Plan (NEPAD), EU Water Initiative, World Bank, and United Nations. Large differences in development levels of riparian countries make cooperation even more necessary, such as with Nile-dependent Egypt and the somewhat less developed, upstream countries involved in the Nile Basin Initiative.

However, Africa is still faced with huge water challenges that cross borders. Many criticize agreements that do come into place because they are meant to look environmental, but in reality are just vehicles to promote hydropower development or irrigation expansions. While rivers may have coordinated cooperation in many places of the continent, groundwater resources lack institutions. Conflicts in places like Darfur and Sudan led to large displacements of people, some into refugee camps, which can aggravate an already stressed water supply with increased concentrated demand for resources. Political instability, mass migration, and limited resources have made cooperation difficult.





UNU-INWEH, Andrew Dansie

Asia:

South Asian water resources connect many countries that historically have had military conflicts between each other. With many of these countries being located entirely within an international water basin, water is a central topic. The separation of India, Pakistan, and later Bangladesh also divided basins between countries. India and Pakistan signed the Indus Water Treaty in 1960, but the Indus basin has continued to be under stress with competition for waters and legal battles against proposed hydropower projects in India.

Developing giants China and India refuse to sign agreements that they view as non-beneficial to their interests as they prefer to maximize their advantage against others. Both countries have expanded hydropower aggressively, such as with China's Three Gorges Dam, having large impacts downstream, since all of the region's basins have hydrological dependence on China. China voted against the 1997 UN Watercourses Convention, India and Pakistan abstained, with only Bangladesh and Nepal voting in favour.

This has led to a culture of mistrust in Asia with less signatories and cooperation. South Asia lacks the coordination that EU countries have with economic and legal policies, and countries react defensively when bigger players like China act unilaterally. Global frameworks like the UN Watercourses Convention require prior notification and data sharing when planning to develop rivers, which may be perceived as going against national sovereignty. Cooperation will be even more important to the area as climate change varies the flows coming from glacial melt.

In Central Asia, more coordination has been seen, especially in response to the Aral Sea disaster. Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan, and Kyrgyzstan formed the Interstate Commission for Water Coordination of Central Asia and pledged 1% of their budgets to help recover the sea. Also, in South Asia, there is still progress being made towards cooperation. While still missing China and Myanmar as active members, the Mekong River Commission has been helping countries in the lower Mekong basin move from humanitarian cooperation to economic cooperation.

Middle East:

While for other areas water cooperation may be a means for development, in the Middle East, water is especially important for security and peace between countries. Many countries with otherwise tense political relations also usually lack water agreements where they are most needed. Throughout the Middle East, desertification, shrinking rivers, and aquifer depletion put stress on water supplies. With the so-called Islamic State controlling parts of Iraq and Syria, questions also linger about water being used strategically as a threat or a weapon.

While there have been positive overtures made towards cooperation, especially around 2008, the existing agreements lack controls and principles that are encoded in other, similar agreements around the world. Iraq, Syria, and Turkey created a technical committee in water and environment and established the Trilateral Water Institute to study efficient management of water usage in the Tigris-Euphrates river basin. However, treaties between the three countries are not being complied with.

Israel and Jordan have come to agreements, such as the 1994 Peace Treaty that included allocations of the Jordan River and joint efforts to prevent water scarcity, but cooperation is even more important today. The Dead Sea's levels have been falling over one meter per year as the flow of the Jordan River, the main tributary, has dropped by more than 98%. A large project to divert water from the Red Sea to the Dead Sea has been developed by the World Bank and three parties — Israel, Jordan, and Palestine — signed a trilateral agreement in 2014. Implementation of any transboundary agreement in this situation is not an easy task with constant political and armed conflict in the region.

With decreasing freshwater available in the Middle East, much attention has been drawn to desalination. The Middle East Desalination Research Center (MEDRC) was created in the Oslo Accords in 1996 and has been an influential third party in bringing Israel and Palestine together for water cooperation. The organization helps build capacity of member countries (Israel, Palestinian Authority, Jordan, Oman, Qatar, US, Spain, Netherlands, Japan, and South Korea) through research and training,

and has built a solar desalination pilot plant in the West Bank. MEDRC helps establish political relations between Israel and other countries it might not otherwise have.

Latin America and the Caribbean:

The most recent data from the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP) indicate that the overwhelming majority of the countries in Latin America and the Caribbean (LAC) have already achieved, or are likely to achieve the Millennium Development Goal for drinking water, despite a great diversity in the level of development amongst the countries. Access to sanitation on the contrary has only been achieved by 46% of the population. Despite the remarkable advances in the expansion of access to improved services between 1990 and 2011 (going from 85% to 94% for drinking water and 68% to 82% for sanitation), Latin America remains the most urbanized and unequal region in the world, with still almost 36 million people without access to improved sources of drinking water, and over 110 million people without access to improved sanitation facilities. In the majority of cases, it is not a problem of water scarcity — as the region has abundant water resources in general terms — but of insufficient investment.

Inequalities are still one of the main challenges in the region. Gaps in service mainly affect low-income groups, which means that between 70% and 85% of the people lacking access to water services are in the two lowest-income quintiles. In rural areas, coverage is consistently lower: 15% in the case of drinking water and 24% in the case of sanitation services. Future challenges in the region include the reduction of such inequalities between rural and urban areas and service improvement, particularly in regards to uninterrupted services. It is also important to take into account that water sources are threatened by climate change.

According to a study performed by CAF, the Latin American Bank for Development, to calculate the costs of reaching the water related SDG targets, the investment required would amount US\$ 12,500 million annually, the equivalent to 0.31% of the Region's GDP in 2010.

To overcome this situation, the region will need to improve and consolidate its water governance with a paradigm shift towards the sustainable integration of water resources management. A special effort from governments will be required to consolidate operational water management institutions to develop water management strategies valuing the local knowledge and practices; to develop and implement water management and economic instruments (water use rights and discharge permits, efficient costs, markets, and social evaluation, etc.); to create decentralized and independent water authorities; and to design water allocation (and especially reallocation) systems that promote investment in the water sector.



Views on Water Cooperation

This chapter presents perspectives of individual authors who have extensively engaged in a diverse range of water cooperation initiatives. The description included in this chapter accordingly reflects diversity on the same topic.

WATER COOPERATION AT VARIOUS LEVELS — A POLITICAL PERSPECTIVE

(Aslov)

The stakes are high, but the current situation, like never before in human history, gives us new opportunities for significant improvement of water resources management. I believe that we are able to address all challenges. The opportunities are definitely here, and we must rise to the occasion and meet these challenges successfully and in a timely manner.

Establishing a mutually acceptable mechanism of water and power resources management that takes into account the interests of both the upstream and the downstream countries can contribute to mutually beneficial long-term cooperation among the countries and their sustainable development. It can also address crises through implementing specific measures on water saving, water efficiency, and waste-water treatment through rehabilitating irrigation systems and lands, and also by improving the agricultural policy through replacement of high water demand crops, such as cotton and rice, with water efficient crops. This could also contribute to addressing food security in the long run.

Decision-makers, linked to various political processes in a government, can be principal engines of progress. For them to be effective, however, mechanisms and instruments are required, including reliable data, institutional-and-legal framework, and adequate instruments of collective actions on water resources management. New challenges, among them climate change and population growth, and the problems they bring, encourage the parties involved to engage in and develop a dialogue of water cooperation.

International institutions and mechanisms (World Bank, UN-Water, WWC, GWP), as well as regional basin organizations and other intergovernmental institutions, influence regional and global water governance. The particular advantage of the World Water Forums is that they provide a venue for discussion both for the governments, and for all other stakeholders involved (including NGOs, children and women organizations, etc.).

It is encouraging that in recent years many countries have started paying more attention to integrated approaches

towards management of water together with other key sectors of the national economy. However, in many cases the national plans of IWRM have not been coordinated either at the transboundary level or with relevant regional strategies. For this reason, many IWRM plans have not reached their full potential or effectiveness.

At the political level, it is political will and provision of a venue for political dialogue that is most vital for sustainable water management; at the technical level, it is establishment of a specific legal framework and creation of institutionalized mechanisms for joint management of water resources, regular exchange of data, sharing experience and best practices, development of relevant instruments of collective actions on joint management of water resources, and adequate financing.

Against the background of ever increasing consumption of food and energy by the world population, (which with current working models will demand ever more water for both processes), deteriorated sanitation and global climate change, it is the nexus approach, water-food-energy-climate, which is becoming more urgent and practical. The implementation of these concepts requires the development of cooperation and partnership not only among the countries, but also among different economic sectors and water users within each country.

The current competitive patterns of water use, differences in seasonal consumption of water and energy resources, as well as their imbalanced distribution, create a conflict of interest not only in economic activities, but also among nature and society. Under the circumstances, it is essential to find new ways of developing a dialogue and mechanisms of cooperation in the management of water resources with due consideration to today's realities.

I believe that fresh water problems that exist today emerged not just as a result of the lack of international agreements, decisions, and recommendations in this area, but also are due to significant gaps at the intergovernmental and regional levels. These gaps include lack of mechanisms for implementing achieved agreements, insufficient coherent monitoring, weak

integration processes, and in most cases, over-representation of national interests that surmount otherwise positive partnerships and favourable regional relations. To effectively address the freshwater issues and problems, the international community should take measures for implementation of coordinated, purposeful, and long-term goals identified in the emerging post-2015 development agenda. There is an urgent need to unite efforts undertaken by governments, international and regional organizations, business communities, scientists, and other representatives of civil society. The transboundary water management in the Central Asian region presents an interesting case study (see Box 1).

A primary and important factor towards improvement of this situation is that the water issue not be politicized. Policymakers at all levels should recognize the human rights of water. It is quite obvious that insufficient efforts have been undertaken at the international level at protecting water sources. We can also take a closer look at the situation at national and local levels, and how improvements can be instigated at those levels.

Water Cooperation at the National Level

Widespread establishment of basin organizations, water user associations (WUAs), water users federations, and councils of the main canals has required a strengthening of their capacity to offer comprehensive solutions to problems of accumulated debt, improving metering of water, tariff systems, harmonization, and the implementation of laws related to water, tax, and customs codes. It is of paramount importance that these practices continue for promotion of IWRM, where the river basin approach would eventually prevail over the administrative and territorial control method, and where political and economic functions in water use would be clearly demarcated.

At the national level, the issues of promoting IWRM should be addressed within the existing National Water Coordinating Councils. New developments around the post-2015 development agenda and implementation of the Sustainable Development Goals (SDGs) would further require that such IWRM practices become fully embedded in the national development frameworks.

BOX 1: TRANSBOUNDARY WATER MANAGEMENT IN CENTRAL ASIA

Central Asia is an example of how inadequate political will, imperfect institutional- and- legal frameworks, and underdeveloped instruments affect the region's ability to manage the existing resources to the benefit of its population and environment. Though it is comforting to note that in the field of water resources management for over 22 years the region has not witnessed serious water use related conflicts among the countries in the region.

The UNDP Human Development Report (2006) indicated that due to lack of adequate water cooperation among the Central Asian countries, the direct losses (that were possible to calculate) were equal to US\$ 1.75 billion per year. This roughly accounts for over 16% of the contribution of the water sector into the GDP of the region; indirect losses and lost opportunities were not included in that calculation.

Climate change, with projected trends of a warming climate in the Central Asian region, would further exacerbate the scarcity of water resources. As shown below for the two key river basins in the region, significant decreases in river flow is projected.

Over the last 50 years, due to global climate change, there has been a tendency of glaciers' diminishing in terms of their volume and area. As a result, the water content of the rivers, which largely (up to 40 to 50%) depend on glaciers' runoff, has already been impacted. However, a number of scenarios foresee an increase in the amount of precipitation in the Central Asian region, which could bring about an increase of glaciers' mass. Thus, there is some uncertainty that requires the attention of the global research community. Regular observations and monitoring are particularly needed for making long-term and super long-term forecasts of the water content in the Amu Darya and Syr Darya river basins.



Wikipedia Creative Commons, Karl Musser

Water Cooperation at the Local Level

Establishment of WUAs, water users federations in the river basins, and water committees in areas of irrigation channels is very crucial for effective water management at the local level to obtain high yields of agricultural crops, as well as maintain farm assets. Widespread inventory should be conducted in order to address issues of securing these funds to specific owners.

Creation and development of water and trust funds at the level of administrative districts would allow to devolve funds from centralized and local budgets, economic

entities, the local populations, and donors to address the issues related to construction, rehabilitation, and reconstruction of water supply, and sanitation on the ground. Involvement of local communities, social groups, families, and individuals in water issues should be ensured legally, organizationally, financially, and economically. Similarly, migration processes in relation to various water issues should always be kept in sight of decision-makers, otherwise it is likely that numerous unintended problems might emerge; these could include loss of irrigated lands, living space, increasing discontent, and social tensions that might lead to unpredictable conflict situations.

Utilizing Integrated Water Resources Management

To provide social support for promotion of the IWRM it is necessary to develop special capacity building programs for various segments of the population, social mobilization, appropriate training, and targeted information.

In the context of the existing administrative and territorial principle of water resources management, the real implementation of the IWRM is possible in the context of reorganization of the overall structure of public administration, not at the expense of changing boundaries of administrative districts and regions, but through the creation of separate structures within the hydrographic river basins and enforcement of existing legislation. In the transboundary water basins, implementation of IWRM requires drafting and signing of agreements and creation of interstate commissions with relevant authorities.

Financial and Economic Mechanisms

There is a need for clear legal, organizational, financial, and economic mechanisms in order to solve water, energy, environmental, and other issues at the national and regional levels. Sustainable use of water resources has to be based on meeting norms and timing of water use, effective legislative framework, finance and economic regulation (tariffs, penalties, administrative and criminal enforcement), organizational structure (relevant structure of management, unification of water users, consideration for environmental and economic conditions, water meters, consideration of the market conditions, and relevant personnel potential, capable of putting into practice sustainable water use). In many instances, water management organizations and water users lack adequate water metering systems, both in drinking water supply and irrigation. Inadequate tariff systems and deficient systems of charging for water supply services prevent these supply systems from being properly maintained.

The introduction of differentiated tariffs for water, depending on the climatic zones, gravity water supply, and water pumping, etc. would increase water use efficiency. This has to be coupled with the creation of a clear mechanism of mutual settlements between water suppliers

and consumers in all economic sectors, especially in drinking water supply, wastewater management, and agriculture, as well as between individual units of irrigation systems.

At a low level of payment for services in water and energy sectors (20 – 60%), introduction of the IWRM is problematic. For predicting the level of payment for water services and electricity by 100%, there is a need for realistic assessment of the solvency of consumers and relevant economic justification of tariffs. In case of big differences, a state regulation should be carried out based on the current legislation with the provision of incentives, subsidies, and so on.

Improved Legislative Frameworks for Water Cooperation

Optimization and harmonization of legislation are needed to ensure a legal framework for promoting reform, regulation of property rights, improvement of the water and climate change monitoring systems, as well as harmonization of procedures for planning and implementation of activities in the water sector.

The main areas for improvement of normative and legal regulations in the field of groundwater are the issues of property rights, water quality monitoring, and protection and maintaining the Water Register and zoning, and as whole promoting the IWRM.

Application of the law on water quality is more complex than the management of water consumption. It requires a mutually beneficial cooperation in harmonization of the water quality legislation with the general water legislation, establishment of water quality standards, and ensuring their accessibility. Too rigid standards could be excessively expensive for use and may undermine the credibility of the law.

Considering Environmental Issues

The Dublin Statement on Water and Sustainable Development providing that “Water has an economic value in all its competing uses and should be recognized as an economic good” deserves to be formally considered in shared and transboundary water resources.

The downstream countries demand from the upstream countries to take into account the regional environmental restrictions, particularly on water quality in the middle and lower reaches of rivers. Participation of the downstream countries in covering the costs for maintenance of water facilities of regional importance and ensuring proper water quality is important for mutually beneficial cooperation. From the standpoint of international law it can be resolved by negotiations and conclusion of appropriate agreements, which is very important in order to prevent possible conflicts in the region.

Problems in this area are as follows: deficit and low levels of qualification of personnel, weakness of the database, need to increase the frequency of sampling, expanding the range of performed analyses, lack of funding, interdepartmental difficulties with the exchange of information on water quality, outdated methods of analysis, etc.

For an effective water quality management in the Aral Sea basin, it is necessary to consider the establishment of an interagency national and regional monitoring service, which would be operated and developed on a single scientific and methodological basis according to the principles of the basin (integrated) water management.

Fostering Water Cooperation through Hydropower Management

Hydropower can significantly expand the field of water use, link the interests of all water users in the interests of irrigation, power generation, recreation, water transport, flood control, and other sectors, thereby increasing the efficiency of water use. It is an effective tool for accounting of water resources and may be a potential target for joint management, which is very important for the development of cooperation. Furthermore, the development of hydropower not only contributes to the efficient management of natural disasters (floods, mudflows, droughts, etc.), but also contributes to the solution of other important tasks towards achieving sustainable development of the countries and regions, such as ensuring “green” energy and economy, as well as meeting significantly the needs of the Central Asian and neighboring

countries (Afghanistan, China, India and Pakistan) for ecologically sound power generation. An example of such cooperation could serve the implementation of CASA-1000 (Electricity transmission line project between Kyrgyzstan – Tajikistan – Afghanistan – Pakistan) in cooperation with the World Bank and other partners.

Hydropower should be developed on the basis of the schemes of hydrographic areas and river basins, since it is connected with all the elements of the IWRM. For its development, including for small hydropower plants, there is a need for simultaneous creation of production, a basis for the production, and repair of technological equipment. For the operation of small hydroelectric power stations, there should be service facilities and multi-level training should be provided.

In the IWRM system small hydropower is particularly important, because it is closest to direct consumers. It can help stop the growth of energy and water resources deficits for end-users. The role of small hydropower will be effective in the economic and social spheres with its comprehensive development, especially in irrigation systems. It is advisable to assess its development through feasibility studies.

It is necessary to carry out the construction of large and small hydroelectric power stations within the framework of the ecosystem approach with environmental impact assessments and prevention and mitigation of their negative impacts.

Regulation of river flow is mainly linked to its complex use in the interests of various water users. There are certain contradictions and competition for water use between irrigation and large hydropower. Small hydropower is neutral with respect to such conflict of interests, because it is derivative and does not affect the river flow regime. The national energy systems of the Central Asian countries cannot rely solely on small hydropower due to its low power output. In these circumstances, a conflict-free control of the water flow is only possible with integrated management of irrigation, hydropower and thermal power plants in all Central Asian countries.



WATER COOPERATION IN PRACTICE

(Maestu)

The Evidence

There is much evidence about successful water cooperation at different levels: among countries, among stakeholders in river basins, between farmers, between companies and their communities, and between local authorities and local stakeholders. A systematic analysis of the lessons from what works and what does not work in water cooperation

is presented in the Chapter on The Way Forward. This section highlights unusual or especially relevant aspects drawing from selected experiences of water cooperation, in relation to legal frameworks, the role of financing, empowerment, and stakeholder participation.

Evidence shows that cooperation has endured and has served and serves everyday to manage differences in interests successfully. This has been the case with the more than 50 years of standing water cooperation between such diverse partners, such as Finland and Russia (see Box 2), the long history of cooperation among irrigation farmers in Mediterranean countries, and in India (Suresh A. Kulkarni, and Avinash C Tyagi. 2013) dealing with disputes through water tribunals and juries. They provide compelling evidence on where we have to go and what it takes to maintain cooperation.

Experience shows that cooperation takes place everywhere but also at all levels. There have been examples of cooperation such as those in the Sava Basin, Tisza Basin, Spain-Portugal shared basins, Russia-Finland, in Ethiopia, Kenya, South Africa, decentralized countries in Europe, and at local levels in Bolivia, Peru, Madagascar, Morocco, Guatemala and many other countries. We have seen how in many cases cooperation can be fragile, and fall apart or evolve and grow into stronger and more sustainable arrangements.

It is not always easy to initiate and/or to sustain cooperation. It can be a long process such as in the case of Finland and Russia (see Box 2). It has also been a long process in the Nile Basin after historical conflicts since 1998, in the Niger basin revitalizing of the Authority after four decades of fragile existence, in the Zambezi basin where no agreements have been signed in spite of enormous efforts, and in the Syr Darya river basin where the agreement on energy did not persist (World Bank, 2012).

The world is changing with new technologies, urbanization, and climate impacts and countries have ambitions for development. There are now different opportunities for cooperation, including data and information sharing, co-collecting trusted hydroclimatic data compiled in real time, and developing risk assessment and joint management plans.

The Legal Imperative

International legal frameworks, such as the UN Watercourses Convention at a global scale or the Water Framework Directive at a regional one, have played a fundamental role in fostering cooperation agreements. They have been key in Sava River (see Box 3), the Tisza River and in the Albufeira Convention, as well as in other countries in Europe and other regions in the World.

A combination of rules and incentives to enable cooperation: Experiences in Kenya and Bolivia (see Boxes 4 and 5) show that the appearance of collective action arrangements is the result of enabling legal frameworks. However, the incentives in place must be enough to prevent further water resource degradation, which in many cases requires credible sanctions. The implementation of these rules and incentives must be done by the community itself and not be perceived as an imposition from others.

Sharing values and agreeing on principles in relation to water is a critical step to trust, while managing water as a collective good. It allows society to be organized around water and contributes to shaping social norms around water responsibility. These preconditions open the road for effective community based water management and will increase the effectiveness of capacity building strategies and the profitability of financial support. It is challenging to build institutions and agree on water management principles (solidarity, subsidiarity, and multicultural). This is not the outcome of a bargain between “equals” but a negotiation among the diverse — an intercultural dialogue in which local values and conventions need to be recognized and accepted as, for instance, in Indian and Bolivian cultures where water might be even considered a partner in the bargaining process between the “human” and the “water”.

BOX 2: AGREEMENT BETWEEN RUSSIA AND FINLAND ON THE UTILIZATION OF THE FRONTIER WATERS

The cooperation between Finland and Russia is based on the 1964 Agreement for all. The 1964 agreement has many basic principles, which the Helsinki convention now contains, and these have been implemented. It includes regulations on: Water flow and structural measures; Floods and water scarcity; Timber floating and navigation; Fisheries and fish migration; Pollution and water quality; Frontier guard issues (related to water); Public health and economic considerations.

The Joint Finnish — Russian Commission was established in 1965. Each party appoints three members, three deputy members, experts, and secretary and has Annual meetings (50th meeting in 2012, 50th anniversary in 2014) and has permanent working groups. The Commission includes scientists, diplomats, and representatives of ministries. This has facilitated a high level of trust between both countries, which allowed good achievements and implementation. The Commission's long-term cooperation has been successful and well respected also in the field of water protection. The monitoring of transboundary waters started in 1966 initially including all major rivers. As most transboundary waters were (and still are) almost in a natural state, monitoring was concentrated in the south-eastern part of the river basin which is exposed to wastewater loading from communities and industrial plants. For water quality and water protection there are common monitoring programs. The main challenges relate to water regulation, hydropower production, and control flood risks. This often means that there is a need for development targets at the outset and investigation of alternatives jointly. The Commission analyses all the impacts of the potential actions from the point of view of either party in a holistic way. As management of water involves the management of industries, agriculture, and other users, there have been working bodies created, involving users. One of the most significant results of the cooperation is the Discharge Rule between Saimaa and Vuoksi. The integrated water management group played a major role when this rule was being prepared at the end of the 1980s. Participation by energy companies has been essential. The 1964 agreement includes the bilateral intergovernmental commission that is between producers.

<http://es.slideshare.net/WaterforLife/seppo-rekolainen-finlandrussia>

https://www.un.org/waterforlifedecade/water_cooperation_2013/session_1_cooperation_between_nations_and_stakeholders.shtml

BOX 3: THE SAVA RIVER COMMISSION

The Sava river basin, a major drainage basin of the South-Eastern Europe, and the Sava river, the richest-in-water Danube tributary, are widely known for their high environmental and socio-economic values (i.e. for natural beauty, an outstanding biological and landscape diversity, high retention capacity, and high potential for development of economic activities, such as waterway transport, hydropower generation, tourism, and recreation), so that a well-balanced approach is necessary to use the potential and preserve the existing values simultaneously.

The Framework Agreement on the Sava River Basin (FASRB), the legal framework for transboundary water cooperation in the Sava river basin, was created as a response to two major challenges: the need (and obligation) for environmental protection of the basin and the need for economic development of the countries. The need for a new, international framework for water management on the basin level, as a consequence of the geopolitical changes in the region in the 1990's (i.e. decay of the former Yugoslavia), turned the Sava river from the biggest national river into an international river and restricted the water management to the national level of the newly established countries. Despite of all challenges, the FASRB is considered as a solid basis for the integrated water resources management in the Sava river basin. Although rather demanding in terms of the need for resources and continuous joint efforts of the Parties, the FASRB implementation is perceived as a process providing multiple benefits for the Parties, and making steady progress toward the key objective — sustainable development of the region within the basin.

https://www.un.org/waterforlifedecade/water_cooperation_2013/sava_commission.shtml

BOX 4: COOPERATION BETWEEN IRRIGATORS' ASSOCIATIONS IN THE WATERSHED OF ALTIPLANO-VALLES IN BOLIVIA

The irrigation project of Tiraque-Punata (which covers 8,000 ha and serves 5,000 families) is located in the mountain area of Cochabamba in Bolivia. It is a project designed to be self-managed by the users. The basin of the Tiraque-Punata is an example of the importance of traditional uses and habits of the common use of water sources. This is mediated by reciprocal relations among local communities and irrigation committees, dispute and negotiation practices in water management, the joint search of solutions for the improvement of infrastructures and the permanent search of agreement among organizations for its management. The changes in the relationships and its implications for the State and water-related institutions are of great interest. The main lessons from this experience relate to 1) the agreements and disagreements for water distribution in the river basin and the changing dynamics; and 2) the inter-culturality and differences in visions among farmers and technical experts. The experience highlights the role played by the user associations.

<http://es.slideshare.net/WaterforLife/luis-salazar-humbertogandarillasiego>

The Role of Secretariat, Including Mediation

It has to be recognized that cooperation is a long-term commitment and requires sustained efforts. Creation of joint secretariats and institutions has been essential to sustain cooperation efforts. This has been the case of Sava River (see Box 3), Senegal River, Russia-Finland cooperation experiences, among others.

The Secretariat of a convention or a transboundary agreement plays a central role in ensuring transparency, which has often proven to be vital in generating the necessary trust among parties. Exchanging information and establishing monitoring and assessment systems have contributed to this. The UNECE Convention, the case of Senegal River, the Euphrates and Tigris Initiative, and the Jordan River show how this works in practice.

Mediation is the key to create the pre-conditions to enable a long-term cooperation environment. Mediators and diplomats have been worthy of consideration in cases like Jordan, in the Albufeira Convention between Spain and Portugal, and in the experience of the World Bank in Africa (Nile, Senegal, etc.). They have been catalytic for helping the parties. They have supported processes geared towards acknowledging differences and the legitimate interest of the parties as essential to move towards cooperation. Third party roles such that of the World Bank have been essential in establishing strategies to manage the perceived risks in cooperation (sovereignty and others) that has helped unblock cooperation.

Experience has shown that being inclusive and dealing with asymmetries between the parties, and to properly incorporate the different actors that are part of the problem and the solution is inherent to any cooperation strategy.

It is imperative to invest the necessary time and resources to produce the most appropriate solution. Fit for purpose remedies rather than “model” river basin solutions often work better.

Political processes are usually difficult to predict, so anticipation and political acumen of stakeholders becomes

critical. Laying the foundation for cooperation by reducing real and perceived risks prepares countries better for achieving compromises and negotiating successfully.

In order to achieve success, long-term time commitment is needed. We have seen how successful cooperation takes years of planning, facilitation, and confidence building, often before formal negotiations even begin.

Financing Mechanisms

It is important to have funding for the cooperation efforts both as an incentive to start (often provided by international organizations) and for long-term maintenance (ideally provided by the countries or other interested parties).

Financing mechanisms for transboundary water cooperation include: Inter-riparian financing by public means requires countries to fund activities beyond their territories (e.g., dredging work on the Westerschelde undertaken by the Netherlands was largely funded by the Belgian Government); public-private partnerships (e.g., in the Senegal River Basin); revolving funds to engage private investors in projects with positive transboundary externalities; and trust funds for programme implementation, administered by a transboundary or international institution (e.g., Nile Basin Trust managed by the World Bank).

Financing matters but it is not enough: Financial support for cooperation by foreign donors is important; for example, without such support, creation of water user associations might be impossible. However, in the long term, the key is that irrigators in the communities must understand the need for cooperation and the need for mutual support (for example, in the case of overexploited aquifers to allow transparent monitoring). But successful cases, such as one of the aquifers at the Lower Llobregat, show that the shared impetus to cooperate has been key to a return to long-term engagement of stakeholders for the sustainable water management at the aquifer.

Incentives matter: Cooperation between users (agriculture, mining, fishing, etc.), location (upstream/

BOX 5: PERU AND KENYA RURAL WATER COOPERATION

Peru: The Use of Local Funds Allocation Committees (CLAR) and “Concursos” in Water Management

The Users Committee of Chorro-Solis is located in the Caserio-La Florida, in the farming community of Juan Velasco Alvarado in Yamobamba, district of Huamachuco, province of Sanchez Carrión, Department of Libertad in Peru. This committee belongs to the irrigation Commission of Cushurio and the Board of Irrigation Users of Huamachuco. There are 32 members irrigating by gravity or by flooding for the different campaigns to cultivate potatoes and pastures from June to September. Payment for the right to use water is \$0.63 per hour. They are paid at the end of the cultivation campaign (according to the number of accumulated hours in the 5 months) of potatoes and pastures. They pay the Irrigation Commission of Cushuro and this in turn pays the Users Board of Huamachuco. The Users Board returns 50% of income for the maintenance of the irrigation channel.

<http://es.slideshare.net/WaterforLife/antonieta-noli-peru>

Kenya: Mount Kenya East Pilot Project for Natural Resource Management

Mount Kenya is one of the five water towers in Kenya whose water yield contributes close to 49% of the flow of Tana River (the biggest river in Kenya). The river supports close to 50% of the hydropower generated in Kenya; irrigated agriculture; fisheries; livestock production and biodiversity conservation in the lower Tana basin and is thus strategic to Kenya's economic development. These functions were increasingly threatened by environmental degradation in the upper and middle catchment of the river. Deforestation, inappropriate land use practices, and overgrazing triggered soil erosion which contributed to a high sediment load to the river, its tributaries, and the hydroelectric power dams. Increased cultivation reduced the ability of the land to hold rainwater, causing fluctuation in river regime during the rainy season and depressed base flows in the dry season, thereby impairing water supply. Ultimately, the allocation of water resources became a sensitive issue, which could potentially trigger ethnic tension and conflicts. To reverse this vicious degradation cycle, the Government of Kenya initiated the Mt. Kenya East Pilot Project for Natural Resources Management Project (MKEPP). The International Fund for Agricultural Development (IFAD) and Global Environmental Facility (GEF) were approached for assistance in project financing. The overall goal of the project is to reduce poverty through improved food security and improving levels of income of farmers — particularly rural women. It has supported community-based water resources management and the formation of Water User Associations (WUAs), River User Associations (RUAs), and Catchment Area Advisory Committees (CAACs).

<http://es.slideshare.net/WaterforLife/f-muthoni-livingstonekenia>

BOX 6: SCALING-UP MICRO-IRRIGATION SYSTEMS IN MADAGASCAR

Madagascar is a dominantly rural population (70%) and a high-potential agricultural country that knows a situation of poverty and extreme food insecurity, due to a lack of policies frameworks for the agricultural sector. This rural poverty may be amplified by the chronic decrease of water reserve, which is further aggravated by the models of water use practiced by most of the farmers (manual watering, crop flooding, and irrigation line). The strategy of SCAMPIS has been the creation and strengthening of the supply chain of materials adapted to the local context. This strategy has mobilized several actors from the public and private sectors. Some measures have been implemented in order to facilitate the access for producers to the materials. Approximately 9,500 families now have access to the technologies through the supply chain (3 small manufacturers, and 60 resellers of equipment) and other stakeholders (NGOs, projects, and economical operators).

http://www.un.org/waterforlifedecade/water_cooperation_2013/pdf/water_cooperation_in_action_approaches_tools_processes.pdf

downstream) and between urban/rural areas, must be based on the understanding of water as an economic resource. As in the case of Kenya (see Box 5) payment for environmental and ecosystem services can facilitate reconciliation between users — particularly between upstream and downstream riparians.

Social Empowerment and Participation

Transnational cooperation is not about governments alone: Perhaps one of the most compelling examples on how to open up negotiations and ensure endurance has been where in transnational cooperation, governments have given way to stakeholders to enter into negotiations directly — for example, in Finland-Russia (see Box 2) to establish joint management of hydroelectricity. And of course, in other cases among irrigation farmers (Suresh A. Kulkarni, and Avinash C Tyagi. 2013) forming cooperatives that often have delegated powers from governments to supervise water use according to water use rights and deal with disputes.

Attitudes and perceptions are important: Water authorities and public administration have an important role in promoting, enabling, and supporting the process but patronizing attitudes are common in public officials and experts, and this might be an impediment to the development of cooperation and of community based water management abilities. Technical factors are useful for informing the collective decision making process, but not to make the final decision itself. The conditions that are most important to enhance the technical efficiency, the productivity, and the feasibility of the projects depend heavily on the context, the institutions, and the decisions about the rules in place. Peru and Kenya (see Box 5) show examples of what can be considered as an adequate solution according to the perceptions of traditional communities. Theoretically efficient and technically designed irrigation systems in these cases, for instance, were incompatible with traditional borders, land tenure practices, and water sharing agreements and, in spite of their technical convenience, they were not implementable. Conflicting views between technical solutions (mostly based on technical efficiency and yield maximization) and cultural and social norms (based

on empowerment, fairness, and legitimacy) need to be dealt through persistent communication channels and effective public participation from the start.

The need for social empowerment and building on existing social and cultural traditions: Institutional arrangements that favour good practices (such as water concourses) allow social empowerment through rewarding good practices and giving room to innovations for better use of water at a local level. They convey information and allow identification of adapted practices and their diffusion among households, farms, and individual users. For instance, despite financial constraints and limited duration, the scaling of micro-irrigation projects have been crucial in achieving the autonomy of the whole supply chain in places such as rural Madagascar (see Box 6). They allowed a reinforced strategy for sustainable water management to be created. There, traditional agriculture is associated with solidarity, stability, and strong cooperative links. In spite of the small size and the number of plots and families, the solution has not been changing social rules, but rather adapting technology options to the social and cultural environment. Local communities have been engaged in the decision making process from inception to guarantee a solution that is technically feasible, while fulfilling local criteria so it is acceptable and implementable.

MONITORING WATER COOPERATION

(Unver)

Introduction

Monitoring, simply put, involves establishing a baseline — initial state — and observing how/if it changes. In some cases, an end or a desired state may also be present, defined through, for example, projections, predictions, expectations, or goals, against which the change can be assessed. These states may be directly measurable or observable in some cases. In others, they are explained by indicators that are derived from measured or observed data, and at times, from qualitative data and information. The water domain — including water resources management and delivery of water provisioning services — draws its indicators from both quantitative data and qualitative information. Water cooperation is no exception to this.

Water cooperation, defined in its broader scope, covers various levels of interactions between and among parties, stakeholders, and sectors that are involved in the development, use and management of a water resource; in the delivery of water services; or are impacted from either the actions or the consequences of such involvement. The scope covers the full cascade from local communities to transnational domains, implying that monitoring water cooperation is essentially monitoring water management with a special lens. Monitoring and reporting on various cooperation modalities and initiatives in this broad scope are diverse in terms of content, quality, source, availability, and accuracy of the base data and information, and the frequency of the updates available to this base.

Conceptualization of water cooperation in this document and what monitoring water cooperation entails, are based on where the cooperation takes place in a four-dimensional domain, whose variables are (i) level/scale, (ii) modality, (iii) area/sector, and (iv) actors.

Level and scale refer to the dimension that varies from local, such as communities and projects, to sub-basins and basins, other sub-national scopes to national, supranational, and global.

Modality is related to the nature of the interaction involved. It may change from simple exchanges such as those of information, to coordination, cooperation, collaboration, and joint activity or action. Sometimes, in absence of active cooperation, exchanges through second track avenues and through mass media can replace the above.

The third dimension, area/sector, relates to what the cooperation is about or within. It can be linked to one or more water management objectives such as irrigation, flood management, water quality management, water supply, hydropower production, navigation, transportation, etc., as well as broader scopes such river basin management, maintenance of ecosystem services, or to some mutually defined set of development and management objectives. It can also be as basic as data collection, data sharing, or joint monitoring of flows.

The fourth dimension refers to the actors involved in cooperation. Any set of users, stakeholders, communities, institutions, and formal/informal entities can populate this dimension. Farmers to governments, businesses to civil society, along with institutions that are relevant can be involved as actors of cooperation.

Establishing the initial and boundary conditions as well as developing practical indicators showing progress have been the topic of a wealth of research and publications for water resources in general, and for transboundary issues in particular. It has to be put at the outset that a large percentage of the need for cooperation as well as the cooperation itself takes place within broader contexts such as production, conservation, profit, and politics. The political context is the most prevalent and dominant context for the case of transboundary cooperation, while other contexts are more relevant to other forms of water cooperation. Monitoring water cooperation in isolation from these contexts can be misleading and even irrelevant depending on the specific circumstances.

The indicators with which water cooperation can be described and monitored can vary greatly, ranging from somewhat subjective accounts of positive interactions, which may include lessening of negative interactions, to establishment and proper functioning of basin entities, river treaties, and the like at governmental level; and from multi-sector planning and management approaches (e.g., water-food-energy nexus examples in a broader context) to IWRM implementation within the water domain. Case examples involving partnerships between public, private, and civil sectors or entities and joint projects on shared water resources are also often used as indicators of progress in water cooperation.

The following section offers a selective subset from a broad spectrum, with emphasis on transboundary cooperation, and provides examples, references, and processes that are evolving in terms of monitoring and reporting.

Monitoring Transboundary Cooperation

Cooperation around transboundary water resources (or the lack thereof) is the most widely and systematically reported modality of all types. There is a wealth of information establishing baselines for transboundary cooperation and a few of these use their respective baselines to assess progress. A number of monitoring and reporting initiatives on basin and regional scales and global assessment efforts help paint this rich landscape further.

The UN Watercourses Convention was ratified in 2014, paving the road to establishment of a secretariat and subsequent formulation of the various mechanisms needed for its implementation, which are yet to take place. It can be safely speculated that these mechanisms will include an assessment and monitoring scheme in due course.

On a global scale, systematic and comprehensive efforts include Systematic Index of International Water Resources Treaties, Declarations, Acts and Cases, by Basin (FAO 1978a, FAO 1978b); Atlas of International Freshwater Agreements (UNEP, FAO, and OSU, 2002), and various reports, articles, and compilations. In addition, there are programmes, initiatives and databases with

global scope which focus on, or relate to, monitoring, analyzing, and reporting on the legal arrangements, including treaties, conventions, and laws. Some of these are UNESCO's PCCP Programme, Oregon State University's International Freshwater Treaties Database and Transboundary Freshwater Disputes Database, International Centre for Water Cooperation in Stockholm, FAO's WaterLex, and UN-Water's related initiatives.

UNESCO's World Water Assessment Programme (WWAP), although not designed for transboundary waters, has provided data, indicators, examples, and assessments useful to understanding transboundary waters, when the Programme's mandate was global assessments between 2000 and 2013 (World Water Development Reports 1 through 4, 2003, 2006, 2009, 2012).

Monitoring and reporting initiatives at the regional level are diverse and uneven. On one end of the spectrum is Europe's systematized and coherent reporting effort (First and Second Assessments of Transboundary Rivers, Lakes and Groundwaters, UNECE 2007 and 2011) carried out within the implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE, 1992), which has recently been opened to the non-UNECE states (February, 2013 www.unece.org/env/water).

Other broad programs include an ongoing, multi-agency effort, Transboundary Waters Assessment Programme (TWAP), implemented under Global Environment Facility (GEF) International Waters Programme (www.geftwap.org). This indicator-based program aims to provide a baseline assessment to identify and evaluate changes in transboundary systems caused by human activities and natural processes, and the consequences that these have on dependent human populations. The data and indicators generated through this transboundary assessment are organized and presented in a common data portal for policy-makers, donors, and other users for such purposes as exploring the status of, and monitoring the trends in transboundary water systems, in response to national, regional and international management efforts, and for setting funding priorities.

Monitoring and reporting for transboundary waters in regions other than Europe is neither systematic nor periodic. With the exception of the basins where an entity has been established, such as a river basin organization or secretariat to a river treaty, varying levels of reporting abound on the cooperative programs and projects while regional-level assessments and reporting are intermittent and are typically driven or funded by bilateral assistance and development partners (see, for example, World Bank, 2014).

Lastly, it must be stated that defining transboundary cooperation is no easy task. Much research and a great variety of indicators emanating from the research are available for the interested reader, painting a very complex and broad picture. There is also discussion if all forms of cooperation are good and any conflict is bad (e.g. Zeitoun and Mirumachi, 2008) with examples indicating the opposite can be true, especially when a conflicting interaction leads to or catalyzes the initiation of meaningful cooperative process.

State of Affairs on a Global Scale

While specific reporting on regional, basin-level and other scales are non-uniform and sparse, the data and analyses

made available by Oregon State University in their 2008 update, reported in WWAP and PCCP (2009), indicate that the regional distribution of events of cooperative and conflictive nature remained unchanged, with Asia far ahead of the other regions both before and after 2000.

The same report revealed that while infrastructure development, water quantity, joint management, water quality, and hydropower remained as the prevalent topics of these events, the significance they have, had shifted. The changing paradigm of water cooperation, which puts more emphasis on the benefits rather than the water volumes, is clearly visible in the comparison of pre- and post-2000 figures, with the water quantity percentage dropping from 45% to 20% in its total share while each of joint management and infrastructure increased by approximately 50%.

Another manifestation of the change in the relative importance of the issues was the increase in the percentage of conflictive issues around infrastructure, water quantity, and joint management, probably a redistribution at least partially due to the changes in the approaches that occurred over the past two decades.

TABLE 1

PERCENTAGE OF POSITIVE OR NEGATIVE EVENTS OVER THE TOTAL NUMBER OF SIGNIFICANT (NON-ZERO) EVENTS FOR THE PERIODS 1949 – 1999 AND 2000 – 2008				
ISSUE	1948 – 1999		2000 – 2008	
	COOPERATION	CONFLICT	COOPERATION	CONFLICT
INFRASTRUCTURE / DEVELOPMENT	61%	39%	50%	50%
WATER QUANTITY	59%	41%	50%	50%
JOINT MANAGEMENT	94%	6%	86%	14%
WATER QUALITY	76%	24%	65%	35%
HYDROPOWER	95%	5%	78%	23%
FLOOD CONTROL	84%	16%	97%	3%
TECHNICAL COOPERATION	98%	2%	100%	0%
OTHERS	77%	23%	62%	38%

FIGURE 3: DISTRIBUTION OF EVENTS OF COOPERATIVE AND CONFLICTIVE NATURE, BY REGION

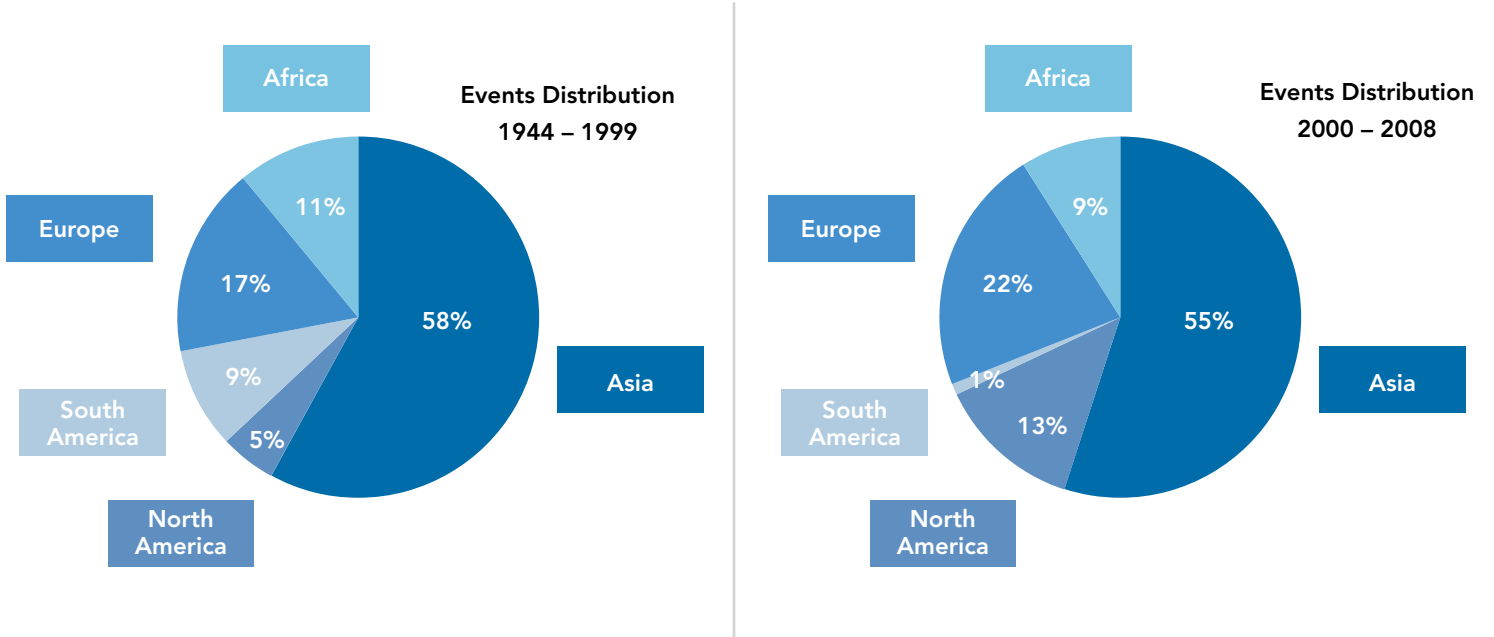
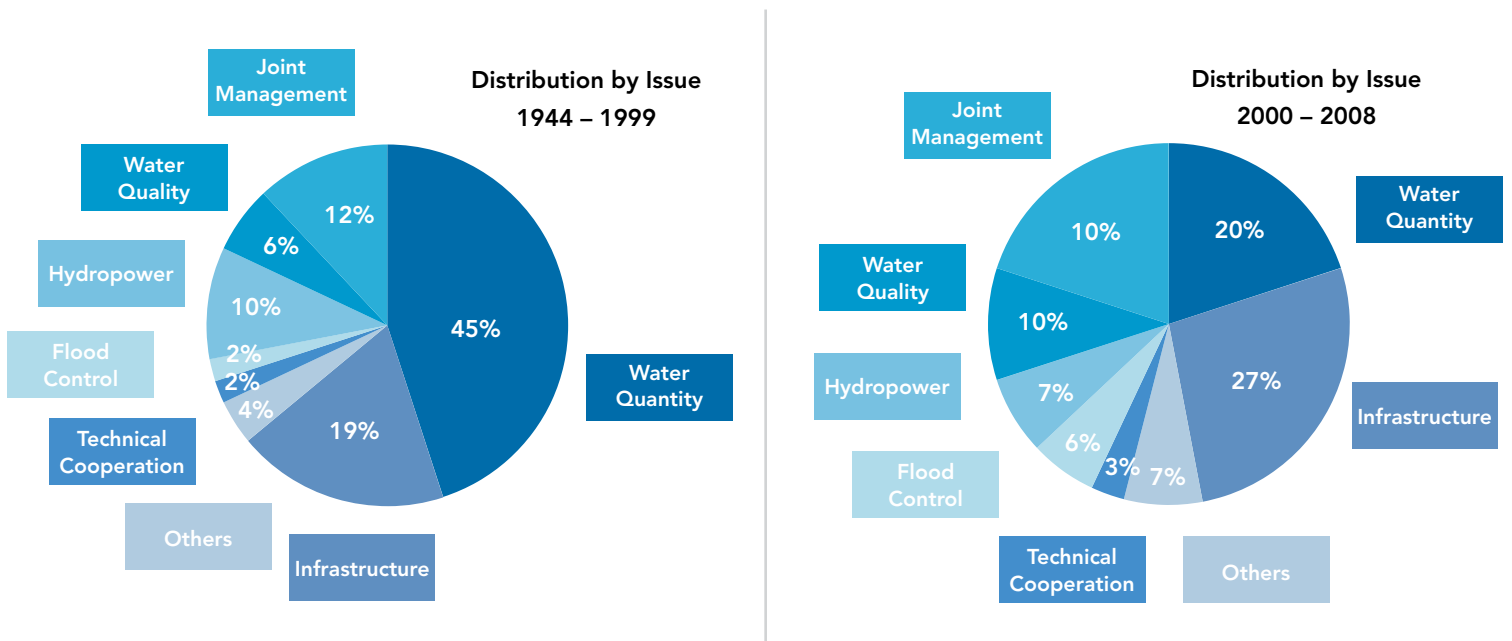


FIGURE 4: DISTRIBUTION OF EVENTS OF COOPERATIVE AND CONFLICTIVE NATURE, BY ISSUE



Water Cooperation Involving Multiple Sectors and Users

The presence, level and nature of interactions in the conservation, development and management of water resources, and in the planning and delivery of water services, irrespective of the presence of a transboundary aspect, are indicative of water cooperation. Cooperation between users of water as well as between sectors offers a rich collection of examples, including the more recent and extensive spectrum involving water-energy-food nexus or other nexus approaches with water as a crosscutting element and the diverse domain of IWRM implementations. Sustainable land and water management is another frame within which international cooperation can be examined (FAO 2011a, FAO 2011b).

A. Integrated Water Resources Management

The integrating nature of IWRM inherently requires cooperation, and when implemented properly, ensures it. The various types of integration that IWRM can bring about, listed below from Snellen and Schrevel (2004, p. 3) show how water cooperation is needed within broad socioeconomic frameworks, among water uses and users, as linked to the other natural resources, and in a multi-jurisdictional context including transboundary aspects.

- » Integration of water resources management in the broader development context
- » Sectoral integration — integrating different use of water / different water using sectors
- » Integration of the (biophysical) resource base
- » Spatial integration (upstream / downstream interlinkages)

Next to transboundary cooperation, IWRM implementation is perhaps the other widely reported mode of water cooperation, albeit implicitly, at all levels, both in the context of global agreements and their implementation (e.g. in monitoring of decisions of 2002 World Summit on Sustainable Development, Rio+20, and potentially SDGs). Global-level assessments on the implementation of IWRM in accordance with the 2002 Earth Summit

have indicated somewhat slow, yet steady progress (UN DESA, 2008; UN-Water, 2008; and UN-Water, 2012). Regional assessments are also widely available (see, for example, AMCOW, 2012, for an assessment of integrated water management approaches in Africa).

While these assessments provide a global monitoring basis, the specific lens of water cooperation has not been adequately incorporated into the data/information gathering part of the process to evaluate whether water cooperation has taken place. It is equally difficult to determine if progress is being made by the governments to rectify barriers to such cooperation. While the mere occurrence of IWRM can be considered as a sign of water cooperation taking place, observed at a point in time, it is not conducive to be used as a long-term indicator of success. Implementation issues related to IWRM in various contexts and in less enabling circumstances, especially in the developing world, have been well documented and commented on and these issues translate into, perhaps more strongly, any monitoring of water cooperation at that level, sometimes as a source of the problem or a contributing factor to the success (e.g., Butterworth et al, 2010).

B. Cooperation around Nexus Approaches, with Emphasis on Water-Energy-Food Nexus

The nexus concept has become a widely accepted approach for bridging sectors, establishing evidence, and generating analytical tools, data and information to incorporate cross-sectoral interlinkages and to address the negative externalities and sub-optimality emanating from compartmental decision-making on sector basis. Properly implemented, a nexus approach has the ability to link the resource base to societal objectives and put the respective stakeholders in the core of decisions and subsequent implementation with proper feedback loops (see, for example, FAO, 2014).

The very nature of the Nexus is about cooperation, thus providing a potential to establish baselines and monitor progress, somewhat analogous to IWRM from a perspective of monitoring. As the concept matures, one can expect, with cautious optimism, that monitoring

tools and systems will follow and be more widely used. Currently, case studies, examples, and compilations of progress on selected projects make up the prevalent mode of monitoring the progress of the nexus implementations.

An example of the above is the set of case studies compiled for the High Level Panel on the Water, Food and Energy Nexus for 6th World Water Forum, Marseille, 2012² and by Vidal (2012).

A nexus approach, through the appropriation of security, can transform the setting into a business opportunity. The milestone Bonn 2011 Conference offered policy recommendations linked to the economy and states “research, knowledge and data must be created and communicated, and better measures to monitor and evaluate nexus outcomes and results must be developed and/or enhanced” (Bonn 2011 Conference, 2012b, page 24), while at the same time there is a need to “establish monitoring systems to comprehensively track and monitor food security, water, energy and carbon movements and nexus indicators so policy development is based on sound evidence” (Bonn 2011 Conference, 2012a, page 19). These systems are yet to be established and set up in a way to effectively inform policy decisions.

A systematic effort to assessing the nexus in transboundary settings is a study that UNECE is currently conducting in line with its function as the secretariat for the UNECE Water Convention, which is an important legal framework for cooperation in the management of transboundary waters, covered elsewhere in this report. The Parties to the UNECE Water Convention decided to conduct an assessment of the water-food-energy-ecosystems nexus in selected transboundary basins with intent to identify how interdependencies and impacts among the nexus components could be used to improve policies in the riparian countries. The current work is centered on developing a methodology to be followed by the actual assessments for the selected basins. Initial results are expected at the end of 2015.

C. Water Cooperation at Community Level

Water cooperation at the grass roots level is perhaps the least visible type among the various levels though they provide genuine solutions to real issues, collectively bringing together a large variety of stakeholders. Global Water Partnership, in its recent report entitled “Water: Catalyst for Cooperation” (GWP, 2013) highlights case studies from aspects of cooperation such as: learning by doing; building knowledge and skills; building shared understanding; raising awareness; sharing information; moving towards formal agreement; integrating water users into planning; and linking local, national, and transboundary cooperation. The examples come from a large spectrum, spread over a broad geography, and include responses to floods, earthquakes, adaptation to climate change, river basin management, and wastewater management from China, Myanmar, Caucuses, Europe, various African regions, Central and South America, and the Caribbean.

Other cooperation examples in countries like Chao Phraya River basin (Thailand), Greater Tokyo (Japan), Lake Peipsi/Chudskoe-Pskovskoe (Estonia, Russian Federation), Lake Titicaca basin (Bolivia, Peru), Ruhuna basins (Sri Lanka), Seine-Normandy basin (France), and Senegal River basin (Guinea, Mali, Mauritania, Senegal) can be found in World Water Assessment Programme’s World Water Development Reports (WWDR) and various publications by UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC).

D. Challenges in Monitoring Water Cooperation

The choice of indicators for purposes of monitoring cooperation beyond a specific basin, project or dispute, especially for regional and global purposes, is quite complicated and depends on the adaptability of the variable under consideration to the multiplicity of settings emanating from geopolitical, socioeconomic, and other dynamics involved.

Irrespective of the above, the availability of water-related data is a fundamental determinant in many cases. There

2 <http://waterandfood.org/wp-content/uploads/2012/03/Water-Food-Energy-Nexus.pdf>

are two major global systems providing reliable data by country basis: Joint Monitoring Programme, (JMP), jointly managed by WHO and UNICEF, for drinking water supply, and AQUASTAT, managed by FAO, for water resources. Any monitoring system for water cooperation requiring quantitative data will need one or both of these systems and will be constrained by what they have to offer. It can be predicted that JMP and AQUASTAT will further extend and enrich their scope in the post-2015 development era to better serve the needs of implementing the Sustainable Development Goals (SDGs) and by both assisting and benefitting from national efforts to comply with the SDGs.

The UN Statistical Commission, UNSC, as a part of its work for developing a global indicator framework undertook an assessment of 304 indicators provisionally proposed to monitor the SDG targets (UNSC, 2015). The assessment is based on a simple yet effective evaluation of the indicators from the viewpoint of feasibility, suitability, and relevance, with three possible ratings for each. The responses received from 70 countries are illuminating in terms of revealing the complexities involved in selecting realistic indicators, given that the data and information for any indicator framework devised will mainly come from the countries, which will also monitor their own compliance with the set targets.

It is interesting to note that the 304 indicators rated have been proposed as a result of an elaborate process of consultations, including technical assistance from the relevant UN entities. Out of the 304:

- » 50 indicators, or 16%, were rated AAA³ — feasible, suitable and very relevant;
- » 39 indicators, or 13%, were rated BAA — only feasible with strong effort, but suitable and very relevant;
- » 28 indicators, or 9%, were rated BBA — only feasible with strong effort, in need for further discussion, but very relevant;

- » 36 indicators, or 28%, were rated BBB — only feasible with strong effort, in need for further discussion and somewhat relevant; and
- » 95 indicators, or 31%, were rated CBB — difficult even with strong effort, in need for further discussion and somewhat relevant.

The evaluation offered in the UNSC Report is yet a re-statement of the fact that for any indicator to be meaningful, it has to be supported by reliable and updatable data in addition to, and even when, the indicator is both suitable and relevant. This assessment, coming from the countries, fundamentally refers to national level considerations. For monitoring on regional and global scales, such data coming from various countries may need to be further validated, harmonized, and brought to a common standards set for their use.

E. Monitoring Water Cooperation in a Post-2015 Development Regime

The post-2015 development era promises to further advance the cause of water cooperation. The SDG Goal 6 of the Open Working Group proposal for Sustainable Development Goals (<http://undocs.org/A/68/970>) is about water, and Target 6.5 under it is termed as “By 2030 implement integrated water resources management at all levels, including through transboundary cooperation as appropriate”. The two indicators proposed for this target, as of the drafting of this section, are “indicator 6.5.1. Status of IWRM Implementation” and “indicator 6.5.2. Availability of operational arrangements for transboundary basin management”. These indicators are rated in the UNSC Report (2015) as BBB and CBB, respectively. In other words, the IWRM indicator was found to be feasible only with strong effort, in need for further discussion, and somewhat relevant. The transboundary basin management indicator received the lowest rating of ‘C’ for feasibility, meaning that it was difficult to obtain even with strong effort.

3 *“AAA” means that the indicator is easily feasible, suitable, and very relevant to measure the respective target for which it was proposed by a majority of national statistical offices (60 per cent or more).*

“CCC” means the indicator is not feasible, not suitable, and not relevant according to at least 40 per cent or more.

Both of these indicators are relevant to monitoring water cooperation and essential if we are to go beyond sporadic compilations, case-based evaluations, and inconsistent comparisons. As stipulated earlier in this chapter, successful IWRM implementation depends on cooperation across sectors and jurisdictional boundaries, although the cooperation component in the proposed, provisional indicator 6.5.1 is implicit in nature. The transboundary indicator, indicator 6.5.2 is explicit and directly relates to transboundary cooperation and hence its monitoring.

A multi-agency initiative entitled Global Extended Monitoring Initiative (GEMI), (http://www.unwater.org/fileadmin/user_upload/unwater_new/docs/GEMI_v2_April_2015.pdf) is underway with the primary purpose of monitoring Targets 6.3 through 6.6 of SDG Goal 6 as stipulated in the Zero Draft of the Open Working Group. WHO, UN-Habitat, UNEP, and FAO are collaborating as the main partners of GEMI under UN-Water coordination with a view to establishing a system that will address the data collection, harmonization, quality control, and country-level profiles on the one hand, and the needs of capacity and other technical support, on the other hand. A pilot implementation in a group of countries will be followed by wide-scale implementation.

As for the two proposed indicators, status of IWRM implementation has been reported by UN-Water and UNDESA as explained elsewhere in this chapter. It can be safely expected that GEMI will benefit from and build on the experience gained and the lessons learned in devising its methodology and in working with countries that will do the reporting in terms of implementing it.

Populating the transboundary basin management indicator will go through considerations that are different from those of the IWRM indicator. There is a wealth of studies, compilations, and databases that can help establish the baseline and potentially serve the monitoring task. FAO's "Systematic Index of International Water Resources Treaties, Declarations, Acts and Cases" and Oregon State University's International Freshwater Treaties, both referenced earlier in this chapter, are among the most systematic and continuously managed ones.

While the presence of a transboundary operational arrangement is a concrete sign of intent for cooperation (Brochmann, 2012), this indicator, if treated as a binary variable (available or not available), may not yield useful and usable information as to the progress in cooperation and once it turns to "available" from "unavailable" may remain static as such. Furthermore, the presence of an arrangement does not necessarily mean nor lead to cooperation. Likewise, not all "positive developments" actually mean progress (Zeitun and Mirumachi, 2008).

Nonetheless, Target 6.5 of a likely SDG Goal 6 on Water can certainly move water cooperation from being a widely recognized and accepted notion to the level of implementation with its country-level implications and monitoring arrangements as applicable, including basin, national, and global scales. The development and finalization of its indicators are outside the scope at the time of the publication of this report, but is certainly essential for the Report's subject matter, water cooperation.



UNU-INWEH, Dave Devlaemincx

CAPACITY DEVELOPMENT FOR WATER COOPERATION

(Adeel)

Multi-Dimensional Capacity Development

Lack of human, technological, infrastructural, and institutional capacity is the foremost impediment to effective cooperation on water issues. Yet, we do not have reliable estimates of the global capacities needed to meet various development objectives, including those now being enshrined in the proposed post-2015 Sustainable Development Goals (SDGs). It is obviously a priority to get a better estimate of capacity needs across the board.

Years of experience indicate that to successfully undertake capacity development, one must consider multiple dimensions in parallel and do so in an integrated manner (Franks, 1999). Some challenges are persistently encountered in capacity development initiatives — namely only one aspect of a multidimensional capacity gap is addressed, leading to less satisfactory outcomes, or often near-complete failure. For example, many capacity development projects focus on training individuals — including a major focus on “training the trainers.” Regardless of who is trained and what their abilities to teach other individuals are, success remains elusive if the institutions and organizations in which they operate are not ready to absorb this additional, better-trained human capacity. The result is disillusionment and disappointment amongst the so-trained individuals, who would often seek better employment elsewhere and contributing further to a pervasive “brain drain.”

Similarly, institutions and organizations operate within a governance paradigm in each country and locale. This governance paradigm must be able to create appropriate and effective laws, legislations, and mechanisms to eventually enforce these laws. Building such governance paradigms does not happen overnight and is not easy. Many capacity building initiatives often side step this crucial element — because it does not offer immediate rewards, or photo opportunities, or the

publicity that frequently comes for bricks-and-mortar projects, or even training workshops and courses.

Finally, once the human resources are placed in adequate organizations that are legally or legislatively enabled to undertake water development work, these outfits still need the capacity to implement actions and projects on the ground. This has to be coupled with the capacity to maintain service, generate revenue streams, and provide customer support. While it may sound simple, this last step of “service delivery” is an elusive one and is hampered by numerous challenges. The most obvious challenge is corruption; one study by UNU indicates that as much as one-third of the investments into water development projects are siphoned off due to corruption (UNU and UNOSD, 2013). Lack of appropriate technology and technical know-how is also a major stumbling block. The triangular flow of support from the global North to the global South, supported through South-South collaboration can be used to overcome this capacity deficit.

To conceptualize these capacity-related challenges, a common “Four-Pillar” framework for such capacity development has been utilized at UNU-INWEH for about a decade. It comprises the following elements:

- » *Pillar 1 — the capacity to educate and train, including community awareness building, adult training and formal education, so as to provide sufficient and competent human resources to develop and apply enabling systems.*
- » *Pillar 2 — the capacity to measure and understand SDS implementation, through monitoring, applied research, technology development, and evaluation, so that reliable data are used for analysis and decision-making.*

-
- » *Pillar 3 — the capacity to legislate, regulate and achieve compliance* through effective governmental, non-governmental, and private sector institutions and through efficient enforcement and community acceptance.
 - » *Pillar 4 — the capacity to provide appropriate, affordable water infrastructure, services and products* through sustained investment and management by both public agencies and private enterprise.

Main Focus of Capacity Building for Water Cooperation

A. Strengthening Human Capacity

A key element in capacity development is to train educators and trainers who are capable of delivering and multiplying impact. Another key consideration is that core capacities, such as technical expertise (for example engineering, statistics, economics, etc.) can be utilized in multiple sectors. In this respect, some critical core capacities include the ability to analyze and utilize data, the capacity to make connections between economic, social and environmental elements, the capacity to undertake integrated impact assessments, the capacity for monitoring, regulation and oversight, the capacity for fiscal management, and the capacity to value cost-benefits of action versus inaction.

Building these capacities usually requires a multi-year, extended engagement (Reed, 2012). Their success, as noted earlier, depends not only on the quality of training imparted, but also on the institutional settings and the ability to reward those with these additional skills. Ideally, such capacity building should be linked to networking that goes beyond the extent of training itself, and also allows for monitoring of long-term progress.

B. Strengthening Transboundary Institutions

It is critical to ensure that institutions responsible for fostering water cooperation are adequately resourced. In order to achieve that, institutional capacity needs to be built on several levels: capacity to co-ordinate, plan, implement, manage, operate, maintain, monitor, and

evaluate, and capacity to develop, regulate, inspect, and enforce standards. Similarly, research and development organizations must possess adequate capacity to understand and respond national and transboundary challenges. To state the obvious, these institutional capacities will reside not only within government agencies, but institutes of higher learning, non-government organizations, and independent agencies.

Capacity for monitoring: As discussed at length by Unver (this volume), reliable data for decision-making is key to improving water management and cooperation. A key aspect is to create and foster institutions that provide certification, accreditation, training, and management services.

C. Technology Transfer

A critical barrier to water cooperation is identifying technological solutions to problems that are appropriate within physical, social, cultural and economic contexts, affordable, and sustainable in terms of operation, maintenance, and replacement requirements. The only way in which countries will be able to determine which solutions are best for achieving sustainable development will be if knowledge, processes, and experiences are shared between stakeholders and technologies are localized so that effective transfer can occur.

In this context, engagement of the private sector is critical in this transfer of technologies and know-how (Adeel, 2014). Sustained technology transfer can only occur with the recognition and acceptance that profit is part of doing business and that some of these profits constitute funds that are re-invested in product development. There is a need to develop mechanisms that can overcome inertia in technology transfer while ensuring compensation for investments in development. By the same token, creation of an enabling policy environment is also critical to incentivize the private sector to take on such capacity building.

D. Strengthening National Institutions

It is imperative that national Governments establish or strengthen existing arm's length water agency. Such institutions would act as a repository for disaggregated social and physical data pertaining to the water system in the local, national, regional, and global context. This information can be synthesized into outputs that inform decision making by a range of stakeholders, not just government. When appropriate, such national institutions can also provide oversight and independent validation of progress towards water cooperation (Huntjens et al., 2012).

Role of the United Nations System

With a direct and express mandate to build the capacity of its member states, the United Nations system collectively has to shoulder the burden — even when this responsibility is shared with other development partners. Despite some major challenges in the effective delivery of assistance and solutions to member states, the UN system remains the only international mechanism that has presence on the ground in all developing countries and has the appropriate linkages to national governments. Over the years, it has undertaken a number of initiatives designed specifically to address capacity needs of the developing countries to better understand their water challenges. United Nations Development Programme's CapNet initiatives is a success story with extensive global presence and measurable impact (see Box 7).

Despite considerable and measurable successes, some key aspects of how UN organizations go about capacity development need to change and improve. These are discussed below.

A. Delivering as One

The concept of the UN delivering as one — as opposed to a myriad of UN organizations overlapping and working at cross-purposes — was conceived and piloted in a number of countries. This has met with variable levels of success, and has not yet expanded to cover all aspects of the UN systems work in all member states. To its credit, the UN system has been aware of its shortcomings and has created UN-Water as a coordination mechanism.

Since its creation in 2003, UN-Water has grown to a conglomeration of over 30 UN organizations and over 35 international organizations and associations as its affiliate partners. The designation of an international water decade in 2005 provided a further impetus to UN-Water, which responded by creating two programme offices: UN Water Decade Programme for Advocacy and Communication (UNW-DPAC) and UN Water Decade Programme for Capacity Development (UNW-DPC). The latter programme, as the name implies, explicitly aimed to address capacity development challenges in the water domain (see Box 8).

B. Resourcing the UN System

Recent economic crises have shrunk the development aid envelope, in general. The UN system has not been immune to these transitions on the global scale and has suffered from chronic funding shortages in the face of ever-increasing global crises and expectations from member states to respond. The results of attempts to reverse this trend and to better situate the UN system within the context of the global development agenda have shown partial success. For example, the Third International Conference on Financing for Development (13-16 July 2015, Addis Ababa) has attempted to establish a holistic and forward-looking financial framework and to commit to concrete actions to deliver on the promise of the post-2015 development agenda and the implementation of SDGs. It is too early to determine the impact of such commitments by the global leaders.

Often, major extreme events like floods, tsunamis, hurricanes, and earthquakes create immediate humanitarian crises that are underpinned by chronic under-development and lack of adequate capacities. Effective responses require both short-term finances as well as long-term development assistance — and the latter gets short-changed as the urgency to respond declines over time. However, it is notable that the *Sendai Framework for Disaster Risk Reduction 2015-2030*, developed during the UN World Conference on Disaster Risk Reduction (14-18 March 2015, Sendai, Japan), recognizes the importance of capacity building and yet does not specifically trigger any actions to address capacity gaps.

BOX 7: UNDP'S CAPNET PROGRAMME

Cap-Net is an international network for capacity development in sustainable water management. It is made up of a partnership of autonomous international, regional, and national institutions and networks committed to capacity development in the water sector. Such networks have proven to be effective at promoting the understanding of integrated water resources management and play a key role in supporting the development of IWRM and the achievement of the Millennium Development Goals (MDGs).

A 2002 Strategy Paper sets the framework for Cap-Net's work in addressing capacity development needs and strengthening of networks for capacity development in the regions and was supplemented by an updated strategy paper for phase 2. An extensive peer review of five regional and three country networks by network managers from Latin America, the Caribbean, Africa, and Asia during the second half of 2008 provided insights in the state of development of the networks, the development of products and programmes, and the delivery of capacity development by these networks. Within the context of environment and sustainable development, Cap-Net Phase IV (2014-2017) will primarily contribute towards the sub-themes of mainstreaming environment and energy and promoting adaptation to climate change.



BOX 8: THE UN-WATER DECADE PROGRAMME ON CAPACITY DEVELOPMENT (UNW-DPC)



UNW-DPC started its work on 1 August 2007 and is located in Bonn, Germany. Working together with members and partners of the UN-Water mechanism, UNW-DPC focuses on institutional and organizational capacity development while covering specific important and emerging water-related themes.

The mandate of UNW-DPC is aligned with the objectives of the International Decade for Action: “Water for Life.” In so doing, it has also provided extensive support to the members and partners of UN-Water, particularly in supporting capacity development initiatives and activities.

The numbers speak very favorably of the performance of UNW-DPC. It carried out more than 120 activities in collaboration with a wide range of UN organizations, international partners and member states; many of these activities culminated in substantive and authoritative publications. In performing these activities, it was successful in engaging 2,300 people from 150 countries with the main aim of enhancing capacity development efforts in support of the water decade.

C. Overcoming Bureaucratic Hurdles

The operations of the UN system require a systematic overhaul to reduce bureaucratic hurdles and improve management and delivery functions. While considerable improvements have been achieved through various “UN reform” cycles over the past two decades, a lot of improvement is still needed. One may even argue that the funding shortages encountered by the UN system are fed by the perceptions and realities of ineffectiveness and inefficiencies in the UN system’s operation.

The interface of UN’s cumbersome bureaucratic procedures with equally cumbersome bureaucratic procedures in most national governments results in major challenges to effective delivery. The institutional capacity development must address this shortcoming in a direct manner to improve the functioning of bureaucracies. Alternative delivery mechanisms that involve and engage non-government stakeholders and players may offer short-term solutions for improving delivery of water-related development solutions.

Resourcing for Capacity Building

The most critical challenge for financing of water cooperation initiatives is the scale and continuity of investment. Whatever financing mechanisms are used — taxation at the local and national levels, user charges, cross-subsidies, private investment, or targeted overseas development aid (ODA) and foreign direct investment (FDI) — a very large absolute increase in funding is essential, at least to the levels agreed in the Monterrey Consensus, or beyond, if deemed necessary.

In the recent past, most of the financing for water-related infrastructure has been raised at the local level. This is likely to continue. During the 1990s, for example, most financing of water and sanitation originated from the domestic public (65-70%) and private sectors (5%), with only 10-15% from international donors and 10-15% from international private companies (Prynn and Sunman, 2000).

For the least developed countries, ODA must be greatly increased, targeted more strategically, and used

more effectively and sustainably. Over the last decade, investment in water through ODA channels has been low and declining, a trend that must be reversed. It is in these poorest countries, primarily in Africa and Asia, where funding shortfalls and needs are the greatest. Lastly, ways must be found to sustain these investments over the long term, both for infrastructure and, of equal importance, for operations and maintenance.

Once funding is mobilized, it must be effectively channeled to the local and watershed level where the water cooperation initiatives would be implemented. Camdessus and Winpenny (2003) have proposed a number of measures to effect this change, including:

- » Multilateral Financial Institutions (MFI) lending directly to sub-sovereign entities
- » National, regional or international Funding Facilities to pre-finance disbursements to sub-sovereigns
- » Decentralized Funds for local initiatives and “Catalytic” Funds to mobilize other flows, empower players and report on impacts, aid efficiency, and leverage
- » Use of financial intermediaries, e.g., national development banks, to channel external and central government funds and to raise funds in local markets
- » Credit pools with an option of joint and several liability
- » Revolving funds using grants to finance the public preparation and structuring costs of complex projects, such as private participation projects
- » Micro-credit schemes to provide seed capital, initial reserves, and guarantees

To ensure that funding resources are effectively used at the local level, the local capacities to design, finance, and manage improved service delivery must be greatly enhanced. To this end, the Camdessus Panel and others have urged that corruption, managerial capacity, sustainable cost recovery, and legal and contractual aspects of water management within developing countries be addressed.



The Way Forward⁴

Ten years have passed!

2015 has been considered a critical year for the international water and sanitation agenda. The Millennium Development Goals have reached their conclusion point, with the water provisioning target having been met in advance, and the sanitation target missed by a wide margin. Equally important is that the General Assembly will agree on the Sustainable Development Goals in its 70th session on the post 2015 agenda, which includes specific targets for water, sanitation, and a number of related areas.

To inform this negotiation, the document entitled ‘Transforming Our World: The 2030 Agenda for Sustainable Development’ is ready. It includes a more ambitious agenda on universal access to basic services of water and sanitation, on improvements on water resources management — including improved efficiency, and on water quality and disaster risk reduction.

In July 2014, the members of the UNGA’s Open Working Group for Sustainable Development Goals finally agreed to propose a unique water goal (Goal 6): “Ensure the availability and sustainable management of water and sanitation for all.” This reflects that water

and sanitation is a key priority for member states. UN, stakeholders, experts, and the water community at large have contributed engaging with politicians, policy makers, governments, and water managers in water and sanitation programs and projects, in knowledge generation and management, and by providing advice based on good practices and appropriate technologies.

There have also been major milestones that have given impetus to the implementation of the global agenda. This includes the 2010 UN General Assembly Resolution recognizing access to clean water and sanitation as a human right, and the designation of 2013 as the International Year of Water Cooperation. The importance of the Resolution on the Human Right to Water and Sanitation to clarify government responsibilities and consider target population as actors with rights has been essential. The importance and the usefulness of the visits and reports of the Special Rapporteur to incentivize and support countries committed to the Human Right needs to be acknowledged as well.

The decade has underlined the value of water cooperation and shown the value of the Water Conventions and actions to sustain and support long-term transboundary collaboration with good examples from Africa and Asia.

⁴ Sections of this chapter have been drafted with the support of Jacob Deutmeyer and Julia Purdy, Interns of the United Nations Office to support the International Decade for Action ‘Water for Life’ 2005-2015 (UNW-DPAC, 2013 a through g).

Of global significance, the 1997 Convention on the Law of Non-Navigational Uses of International Watercourses, after more than 17 years, entered into force on 17 August 2014.⁵ In Europe, we have reached 16 years of successful water cooperation through the Convention on the Protection and Use of Transboundary Watercourses and International Lakes⁶ (the UNECE Water Convention) providing a supportive institutional framework and facilitating higher standards and national water sector reforms. The UNECE Water Convention — now available globally — provides an invaluable framework to support the step-by-step approximation of legislation of the Central and Eastern European countries that acceded to the EU in the 2004 and 2007 enlargements.

As the Decade comes to a close, the post-2015 agenda is emerging on the horizon. While there is a mix of successes and failures, our task is not yet finished. We have to now look more closely at what did and what did not work, and use that to chart a course for water cooperation in the future.

THINGS THAT WORKED WELL

Active and Continuous Involvement of a Third Party Mediator

In the Indus Water Treaty, the World Bank played a critical role in negotiating between India and Pakistan. They offered funding, support staff, and proposals to advance cooperation. The World Bank also was important in integrating Guinea into the Organization for the Development of the Senegal River. The Southern African Development Community (SADC) promoted regional dialogue on Zambezi and Orange-Senque negotiations. Their protocol on shared watercourses also helped serve as a framework for the following treaties.

Inclusion of Social Aspects

The White mission in the Mekong Committee found that maximum benefit of the projects for irrigation

and power developed by engineers could only be achieved with extensive capacity development of the local population. In contrast, in the Riego Tiraque Project in Bolivia, irrigation blocks did not coincide with farming communities and created conflicts in distribution and access rights. This forced them to redesign canals, destroy the old, and build new ones.

Creative Methods of Financing

In the Nile Waters Treaty, Egypt agreed to finance water enhancement projects in Sudan in exchange for water that could be made available. Sudan would pay 50% of the costs for the same percentage of water when needed. South Africa partners with Lesotho through the Lesotho Highlands Water Project. South Africa gains greater access to the river they share in return for funding infrastructure development of Lesotho. Decentralized cooperation allows North-South partnerships to increase financing for development projects. For example, in France, the Oudin-Santini Law allows local governments to devote 1% of their water and sanitation budget to emergency aid projects or medium-long term development projects. This allowed the City of Lorient's sanitation network to help train and plan human resources for a Senegalese village that had a wastewater plant, but not enough skilled staff to manage it. Similar budget laws or taxes have been also place in Belgium, the Netherlands, Italy, and Spain.

Creation of Incentives through Shared Benefit Models

The Organization for the Development of the Senegal River was designed to distribute economic benefits based on how much each country puts into the project. Such benefits also led Guinea to join the Senegal River Charter in 2006 after having served as an observer. Payment for Environmental Services (PES) schemes have helped give farmers/land managers incentives for efficient water management policy. Simple mechanisms like direct contracts between buyers and sellers are mostly used in developing countries, but countries like Kenya have instituted

5 http://legal.un.org/ilc/texts/instruments/english/conventions/8_3_1997.pdf

6 http://www.unece.org/fileadmin/DAM/env/documents/2013/wat/ECE_MP.WAT_41.pdf

green water credits to try to incentivize best practices. Conservation measures resulting from this program are expected to have a ten-fold return on investment.

Water Assessments / Data Analysis

The UNECE Water Convention carries out transboundary water assessments, which proved to be very useful for the International Sava River Basin Commission to develop management plans. The ICPDR Tisza Group also used their river basin analysis to create an integrated management plan that is to be implemented and followed up. A similar management plan was created as well by countries in the Danube River Basin and maps out areas based on Ecoregions, Protected Areas, Nutrient Pollution, Chemical Status of Water Bodies, Urban Wastewater Discharge, etc. The WWF assisted ZAMCOM (Zambezi Watercourse Commission) and dam operators to help show the benefits of maintaining environmental flows downstream. By using studies and making these analyses accessible, they help change operations of dams to replicate flood patterns that restore freshwater and ecosystems. The Mekong River Commission and Asian Development Bank have created the Rapid Basin-wide Hydropower Sustainability Assessment Tool, based on mapping and assessments, to guide decisions on which site, design, operations, and engagement is most sustainable for developing hydropower. The Mekong Commission also has daily data collection that can be shared on the MRC Data and Information Services Portal.

Scenario Planning

One of the keys to success in Okavango River Basin agreements was developing response scenarios to changes in flows, biotic health, water quality, hydraulic, geomorphic, ecosystems, and socio-economic impacts. All riparian parties were involved to have better understanding of how systems function within the basin. Conservation International helps develop decision support tools for the Mekong region based on trade-offs of developing hydropower vs. maintaining fisheries. Likewise, the Rio-Colorado River Basin has a contingency plan that allows either the US or Mexico to decrease discharges in case of drought or accidents.

Step-by-Step Approach

The Finnish-Russian cooperation over transboundary waters has lasted through the Cold War and Soviet Union collapse because of strong political commitment. This is due to a step by step approach taken over 50 years going from arranging organizations to resolving issues, to developing principles, making joint discharge rules, making long term commitments, and examining new challenges.

Private Sector Involvement / Partnerships

The CEO Water Mandate helped bring a strategic framework for water sustainability for companies. They created a Water Action Hub where partners who share water risk could be identified, and organized information is available to help bring collective action. Coca Cola has also been involved with the UNDP on the Every Drop Matters campaign to raise awareness and promote sustainable management of water, as well as with the WWF in Vietnam's Tram Chim National Park to restore habitat and improve river flow. Improving water efficiency can help reduce dependency on other countries for water and reduce conflict.

Effective River Basin Organization (RBO) Structures

In the Sava River Basin Commission, the Secretariat helped build and maintain engagement and trust among the parties. With many effective RBOs, the Secretariat works with project management, data collection, budgetary functions, external relations, and preparation of meetings.

Most RBOs working in practice also have at least an annual meeting, with the possibility of holding emergency meetings in place. In the Rhine River Basin, parties must report on the measures of implementation taken for commission decisions before a set time period. If they were not able to implement a decision, they still must prepare a report allowing the Commission to address the issues. The Mekong River Basin recognizes the principle of prior notification and consultation in the commission. This forced several studies and an eventual redesigning of Laos's Xayaburi Hydropower Dam Project to move actions in the interests of all basin nations.

THINGS THAT HAVE NOT WORKED WELL

Bilateral Negotiations Instead of Watershed-wide

India has held separate negotiations with each nation that shares transboundary waters. Since she is negotiating from a position of power, India was able to develop Ganges agreements with Nepal without considering Bangladesh. In contrast, countries may enter multiple basin agreements to bargain for support in one in exchange for concessions in another. This was the case for Botswana, which entered ORASECOM to gain support in Okavango and Zambezi. It is therefore important to examine hydro-political regions beyond a single basin as well.

Ignoring Long-term Environmental Impacts

Public works projects scattered across Israel, Syria, and Jordan have diverted the flow of the Jordan River to bring more drinking water to cities. The river is now at risk and is dropping the levels of the Dead Sea. Because of high phosphorus levels in Lake Erie, the US and Canada signed the Great Lakes Water Quality Agreement in 1972 to coordinate phosphorus usage and release. The agreement was later revised to help identify, manage, and prevent emerging environmental issues on the lakes.

Limiting Arrangements to Surface Water in Planning

Negotiations between Israel and Jordan did not explicitly deal with groundwater and this has created problems with salinity of water in the lower Jordan.

Agreements without All Riparian States Present

Cooperation efforts, like the Mekong Committee, lack sustainability and feasibility without China and Myanmar. However, keeping these countries involved as dialogue members is important to provide data to the developed systems.

Asymmetrical Cooperative Arrangements

Transboundary flows between Israel (90% of the volume) and Palestine (10% of the volume) are very asymmetric. The Joint Water Committee between the two countries has a

licensing procedure that gives Israel an effective veto for water projects, including drinking water projects, if they see them to be a threat to military or political interests. It can be argued that the existence of a River Basin Organization or treaty does not necessarily mean there is real cooperation.

ACTIONS NEEDED ON WATER COOPERATION

Success of water cooperation requires many partners and numerous interlinked elements. The analysis in this document identifies the following seven key action areas:

1. Sustainable Financial Support

It is necessary to create financial support mechanisms by governments within a basin that operate at both national and transboundary levels. Such mechanisms allow for investments into various projects and initiatives that foster water cooperation, while also ensuring protection of vulnerable social groups when needed.

2. Formation of Targeted National Development Policies

Water issues, and especially issues of clean drinking water and sanitation, should become the pinnacle of water practice at the national (as well as regional and global) levels. Major attention should be given to improvement of water infrastructure, sound and adaptive governance arrangements, introduction of appropriate technologies, capable and inclusive institutions, and improvements in socio-economic regimes (e.g., improvement of legal and regulatory frameworks, organizational aspects and building up potential). It must be realized that increase of investments in the water sector is often not constrained by available financial capital, but by political will.

3. Engaging the Private Sector and Public Financing

Wide engagement through relevant incentives of the private sector in addressing the water sector issues is of vital importance. The governmental support of water



cooperation for integrated water resources management, major infrastructures, and the provision of basic water supply and sanitation services for the very poor by means of subsidies, subventions, preferential loans, customs, and tax benefits will promote progress in this direction.

4. Reinforcing Overseas Development Aid

It is expedient to assess the overall financial needs of developing countries, with due consideration of sources of financing and area of application (water supply, sanitation, irrigation, hydro energy, protection from landslides, recreation, etc.). Where feasible, foreign direct investment (FDI) can supplement and bolster ODA. Collectively, the support of the international community, including the UN system and various donors, and of the governments for national and local level cooperation can be critical to ensure inclusive water cooperation that effectively deals with asymmetries among actors.

5. Prioritizing High-Risk Areas

At the international level, prioritizing regions and river basins on the bases of urgency, need, and scope is essential. This prioritization should take place in the context of implementation of the post-2015 development agenda. For example, the Aral Sea region meets all the key criteria for being characterized as a regional priority.

6. Improved Management of Risks

Increasing the resilience of societies requires significant improvements in the following domains: procedures for processing and analysis of hydro meteorological data; coordinating role of Governments in population preparedness; systems of forecast and early-warning at the regional, national, and local levels; comprehensive management of floods, with establishment of an apex government body; means of communication for increasing of preparedness of organizations and populations; and legal and political structures that are compatible with structural plans.

7. Empowering Communities and Respecting Cultural Diversity and Local Traditions

Water authorities and public administration have an important role in promoting, enabling, and supporting stakeholder engagement and participation, respect for the traditions, and considering the perceptions of communities in relation to cultural and social norms (based on empowerment, fairness, and legitimacy). Ensuring this requires persistent communication channels and effective public participation from the start. Local communities need to be engaged in the decision making process from inception to guarantee a solution that is technically feasible, locally acceptable, and effectively implementable.

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